

HISTORIC STRUCTURE REPORT

BIRCH CREEK RANCH

HISTORIC RURAL LANDSCAPE

MALHEUR COUNTY, OREGON



United States Department of the Interior

BUREAU OF LAND MANAGEMENT
Vale District Office
100 Oregon Street
Vale, Oregon 97918

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Dr. Leland Gilson, PhD
State Historic Preservation Office
1115 Commercial Street NE
Salem, Oregon 97310

Dear Dr. Gilson:

Enclosed is the Historic Structure Report, Birch Creek Ranch Rural Landscape, Malheur County, Oregon, prepared by Heritage Research Associates to guide the BLM as they maintain and repair the contributing and non-contributing structures at the ranch.

Please review the document. If you concur with its findings and measures, the BLM will adopt it as the standard of non-intrusive repair and maintenance, in keeping with the historic values of the ranch.

If you have questions or require more information, please contact Alice Bronsdon at 541/473-3144.

Sincerely,

Cathy B. Wilbanks ACTING

Jerry L. Taylor
Jordan Resource Area Manager

Enclosures (as stated)

HISTORIC STRUCTURE REPORT

BIRCH CREEK RANCH
HISTORIC RURAL LANDSCAPE

MALHEUR COUNTY, OREGON

by

Jill A. Chappel

Submitted to

Bureau of Land Management
Vale District Office
100 Oregon Street
Vale, Oregon 97918

under terms of
Purchase Order No. 1422H020-P5-0049

Heritage Research Associates, Inc.
1997 Garden Avenue
Eugene, Oregon 97403

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Heritage Research Associates Report No. 188

ABSTRACT

This document presents technical data obtained through field observation of the materials, construction, and condition of selected buildings and structures within Birch Creek Ranch Historic Rural Landscape, a National Register property managed by the Bureau of Land Management in the Owyhee Wild and Scenic River corridor in southeastern Oregon. The report serves as a management tool in the agency's effort to preserve, in a way that is consistent with the property's National Register status, those buildings that presently contribute to the National Register significance of the Birch Creek Ranch Historic Rural Landscape. In addition, it will guide the BLM in maintenance and repair of the historic fabric of the buildings and preservation of their historic character.

The organization of this Historic Structure Report is consistent with the format currently used by the National Park Service, and one that is recommended by NPS for use by all federal agencies. The document is comprised of three main sections: Developmental History, discussing the historic context of Birch Creek Ranch Historic Rural Landscape, the chronology of development and use of each building, and a physical description of each building; Treatment and Use, which identifies the causes of materials deterioration, suggests preservation treatment, and identifies how the buildings will be used in the future by the BLM; and Record of Treatment, which stresses the need to document all preservation work conducted on the buildings and offers recommendations for future preservation work at the Birch Creek Ranch Historic Rural Landscape property.

PREFACE AND ACKNOWLEDGEMENTS

Preparation of this report was carried out under the terms of Purchase Order No. 1422H020-P5-0049 between the Vale District Office, Bureau of Land Management and Heritage Research Associates, Inc. (HRA) of Eugene, Oregon. Alice Bronsdon, Cultural Resource Specialist, served as the Contracting Officer's Representative, while Jill A. Chappel served as Principal Investigator for HRA. All portions of this report were written by Jill A. Chappel. Maps and measured drawings were prepared by Kevin McCornack and Jill A. Chappel. Fieldwork was conducted September 5-9, 1995 by Jill A. Chappel.

HRA thanks the BLM ranch caretakers at Birch Creek, Paul and Rita Krause, for their contribution of knowledge about the history of the property, their ambition to collect important historical information from local citizens, and their overwhelming hospitality. Alice Bronsdon helped the fieldwork run smoothly by offering maps, historical documentation, and lodging. Additional thanks are extended to Stephen Dow Beckham, Department of History, Lewis and Clark College, for sharing his fieldnotes from the 1988-89 National Register nomination work and to Donald Peting, Department of Architecture, University of Oregon, for technical assistance regarding materials deterioration. Lisa Sasser, Assistant Chief Historical Architect for the National Park Service in Washington, D.C., gave some of her precious time to answer questions regarding format and content of this Historic Structure Report.

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1. INTRODUCTION

Birch Creek Ranch Historic Rural Landscape, situated on the Owyhee River in central Malheur County, Oregon, is a National Register eligible *rural historic landscape* owned and managed by the Bureau of Land Management. The property was acquired under the stipulations of the National Wild and Scenic Rivers Act as part of a program to protect outstandingly remarkable resources of historic value within the Owyhee Wild and Scenic River corridor. The property is comprised of two separate historic ranches encompassing 288.11 acres, 122.63 of which define the Birch Creek Ranch (Upper Tract) and 165.48 acres of which define the Morrison Ranch (Lower Tract). For management purposes, they are collectively referred to as "Birch Creek Ranch Historic Rural Landscape" by the BLM.

The property is located in T27S, R43E, Sections 6, 7, and 18 approximately 35 miles northwest of the town of Jordan Valley, the nearest commercial center (Figures 1 and 2). The property has limited accessibility by roadway, the only direct route being the Jordan Craters Road. This road is a gravel and dirt byway that traverses the rolling Owyhee Plateau and Jordan Craters lava field, then drops down dramatically into the Birch Creek drainage (an elevation decrease of 1,900 feet) to the creek's confluence with the Owyhee River. Access to the ranch is also achieved by boat via the Owyhee River or by horseback. The physical environment is characterized by the erosive effects of the river and fairly recent volcanic activity. Nestled in the heart of the Owyhee Canyon with its steep walls of weathered ash and lavas, Birch Creek Ranch Historic Rural Landscape is surrounded by colorful geological scenery formed by episodes of intermittent volcanic eruptions and later occurrences of block-fault uplifting (Orr et al. 1992:98-99). The Birch Creek and Morrison ranches are watered by year-round flowing streams, thus creating a verdant oasis of brilliant green in contrast to the browns, tans, and pinks of the canyon walls.

As mandated by the National Historic Preservation Act, the Federal Land Policy and Management Act, Executive Order 11593, and the Archaeological Resources Protection Act, the BLM is required to protect and manage cultural resources on public lands in their jurisdiction. The National Historic Preservation Act in particular orders federal agencies to assume responsibility for historic properties preservation. This is accomplished through a program of identification, evaluation, and stewardship of all cultural resources on public lands. Birch Creek Ranch Historic Rural Landscape was formally determined eligible for listing in the National Register of Historic Places in January 1992; thus the BLM must ensure the future protection and preservation of the ranch property (Beckham 1989; Bronsdon 1992).

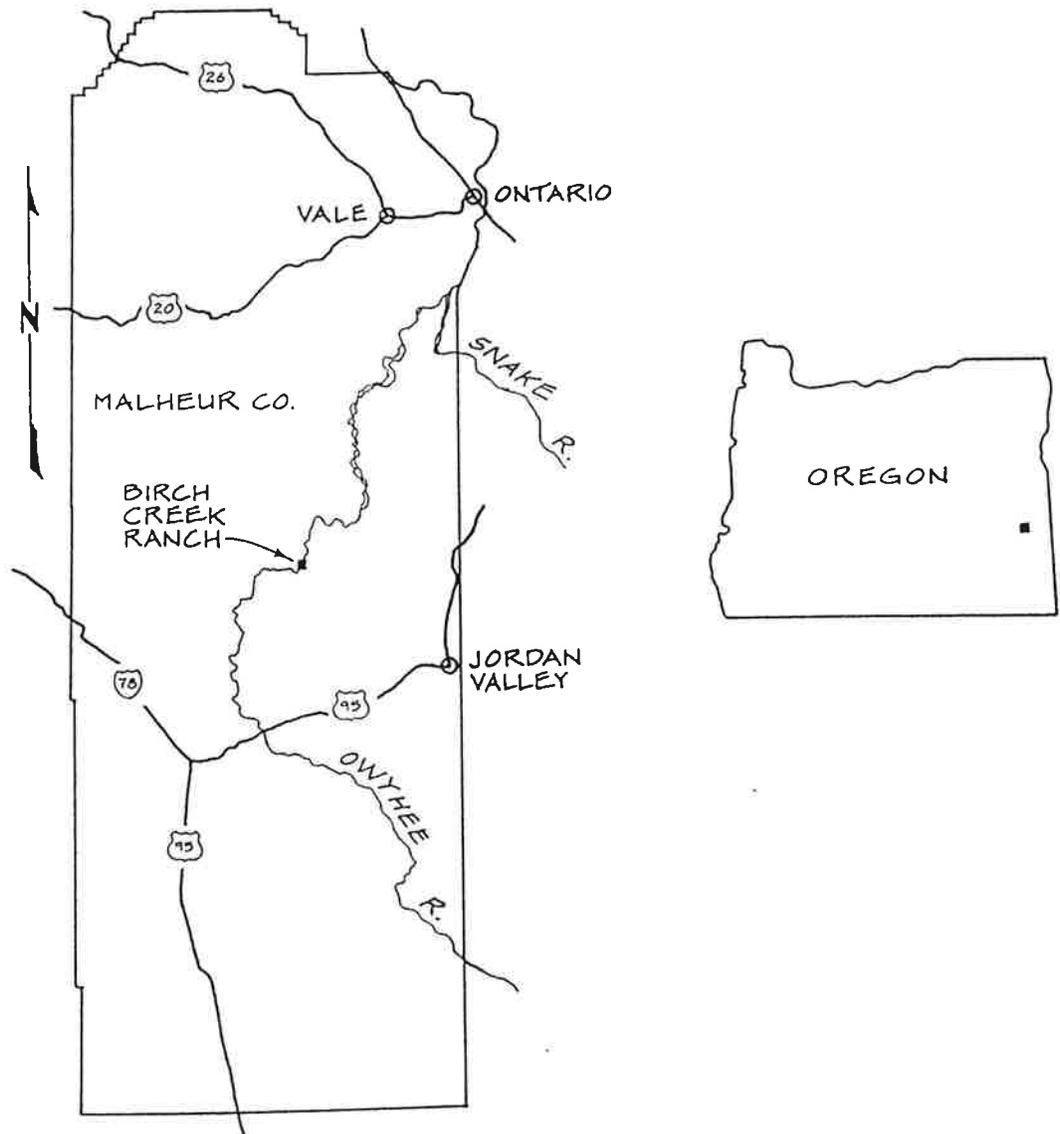


Figure 1. General location of Birch Creek Ranch Historic Rural Landscape in Malheur County.

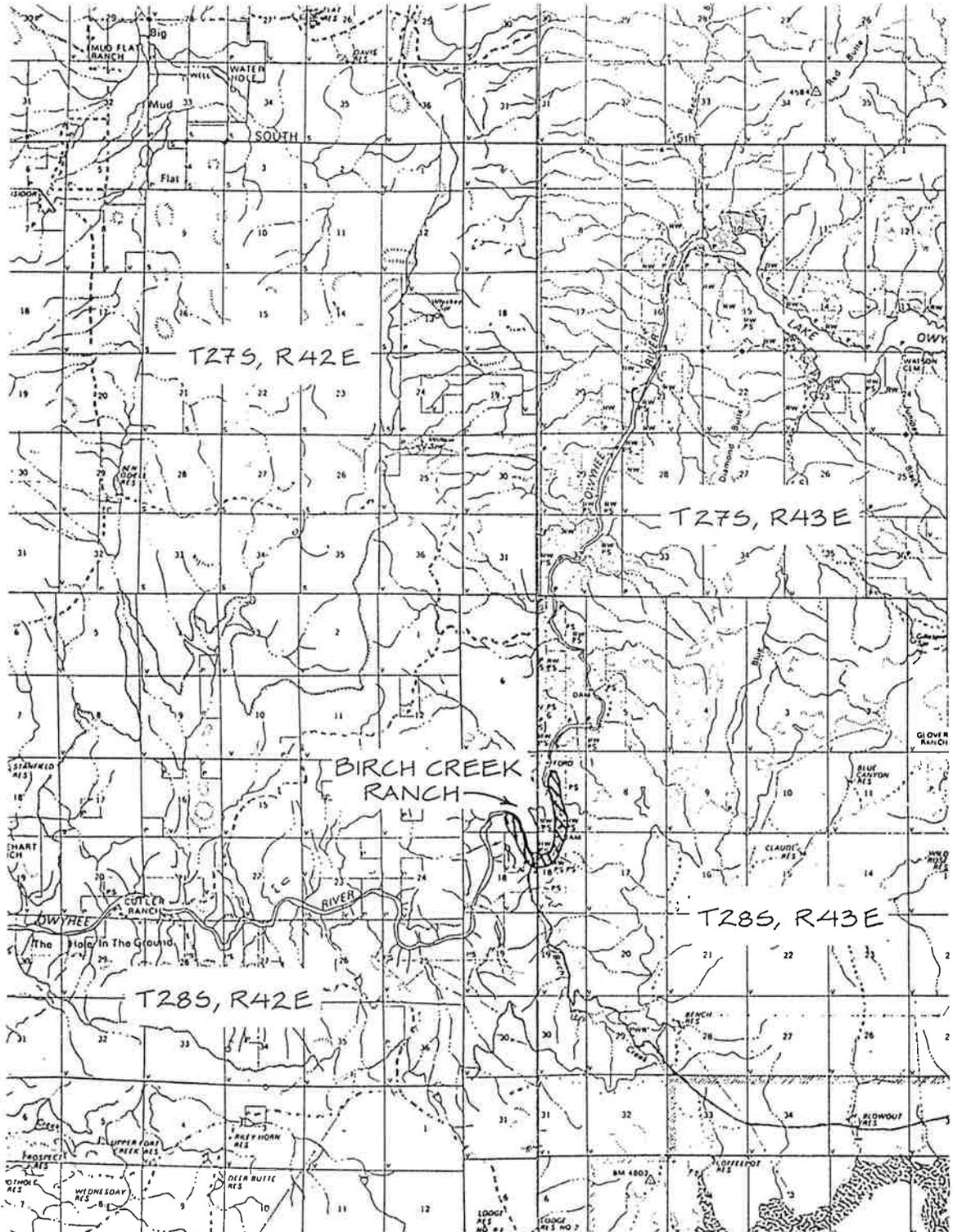


Figure 2. Location of Birch Creek Ranch Historic Rural Landscape on the Owyhee River.

One of the objectives of the BLM's cultural resource management of Birch Creek Ranch Historic Rural Landscape is to maintain the buildings in a manner consistent with the National Register status of the property, the National Historic Preservation Act, and the historic context of the ranch. The BLM has an additional obligation to manage the historic property in the best interests of the public, including maintaining certain health and safety requirements, accessibility, and providing interpretation of the ranch's history. In partial fulfillment of these goals, the BLM has undertaken a historic structures investigation to guide the agency in the preservation and appropriate treatment of specific buildings and structures that contribute to the National Register significance of the property. It is this goal of long-term preservation of contributing architectural features that has driven the BLM to request the drafting of this Historic Structure Report. It is one part of the three-phase program of research, planning, and stewardship that contributes to the preservation of historic buildings and structures by documenting and maintaining the historic character of architectural resources and by attempting to retard the processes of deterioration that eventually lead to the loss of historic fabric and historic character.

The National Park Service, the authority on the preservation of historic buildings, specifies that a historic structure report is prepared to "minimize loss of character-defining features and materials whenever existing information about the developmental history and condition of the historic structure does not provide an adequate basis upon which to address anticipated management objectives, whenever alternative courses of action for impending treatment and use could have adverse effects, or to record treatment" (National Park Service 1995:125). A historic structure report typically combines archival research with on-site investigative research and records the construction history, modifications in construction and use that have taken place through time, and the current condition of the structural system and materials through written descriptions and graphic documentation. The report lists any problems in a building caused by materials deterioration and structural inadequacy, evaluates those problems, and recommends treatment procedures to remedy the problems. The standards presently used by the National Park Service for historic structure reports are found in Appendix B. Photographic documentation for this report is provided in a separate volume.

This document is not intended to be a complete report for all contributing cultural features within Birch Creek Ranch Historic Rural Landscape. As noted, only certain buildings and structures are addressed at this time, and the BLM should keep this document open-ended so that comparable data on the other contributing features at the ranch can be added to this report.

2. DEVELOPMENTAL HISTORY

Establishing a historic context for Birch Creek Ranch Historic Rural Landscape is important for understanding the development and characteristics of the built environment at the ranch, especially in prescribing treatment and appropriate uses for the buildings and structures. Knowledge of local settlement patterns, economics, and building traditions will aid the BLM in their overall management and preservation effort of the property. The developmental history of the buildings and structures in the Birch Creek Ranch Historic Rural Landscape documents not only how the buildings were constructed, but also reports on their current condition and causes of deterioration that can be identified through physical examination.

HISTORICAL BACKGROUND AND CONTEXT

The Birch Creek Ranch Historic Rural Landscape property is comprised of two separate ranch complexes about a mile and a half distant from one another and linked by a historic road along the Owyhee River (Figure 3). Birch Creek Ranch, also referred to as the "Upper Tract," is located at the mouth of Birch Creek and was first settled by a Basque sheepherder (Domingo Lequerica) and subsequently operated by other Basques in the sheep industry (Donato Uberuaga and Simon and Mercedes Acordagoitia) through the historic period (Figure 4). The Morrison Ranch (the "Lower Tract") was settled by cattle and horse rancher James Morrison (Figures 5 and 6). Both properties were homesteaded between 1899 and 1901. The property was used as the headquarters for livestock ranching operations throughout the historic and early modern periods until 1968-1971 when the ranches were sold to Martin Rust II, who used the property strictly for recreation purposes. Both Birch Creek Ranch and the Morrison Ranch were acquired in 1988 by the Bureau of Land Management and were combined as one unit under a National Register of Historic Places eligibility study in 1988 that culminated in a formal determination of eligibility by the State Historic Preservation Office (SHPO) as a *rural historic landscape*.

Birch Creek Ranch (Upper Tract)

The exact date when Domingo Lequerica initially came to Birch Creek and the Owyhee River is not known, but he and a friend, Martin Achavia, were the first Basques to come to the McDermitt, Nevada country looking for work in the late 1880s (Hanley and Lucia 1980:194). Domingo Lequerica arrived in New York City in 1886 and found his way to northern Nevada. It was in this country that Lequerica first

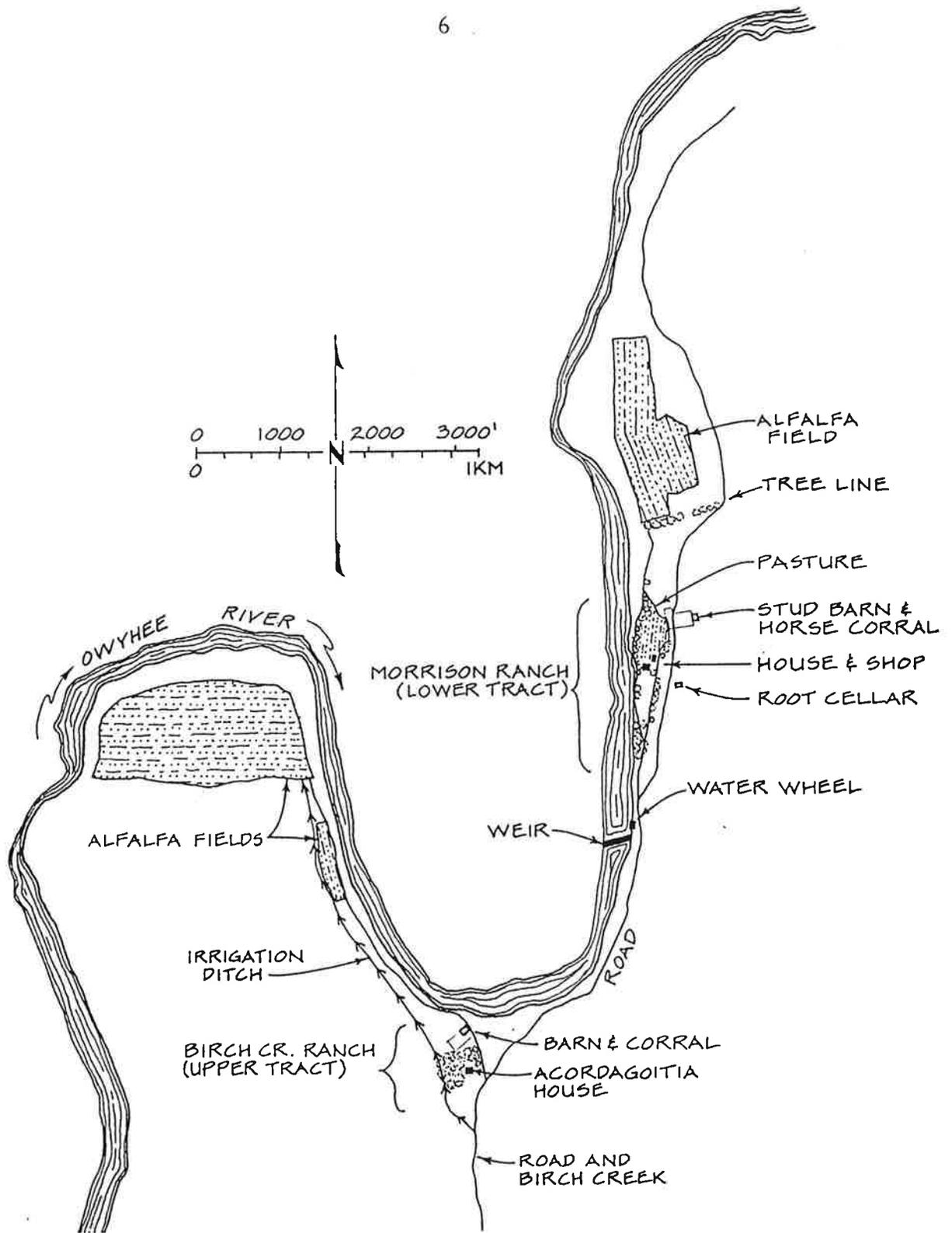


Figure 3. Spatial relationship between the two ranch tracts Birch Creek and Morrison.

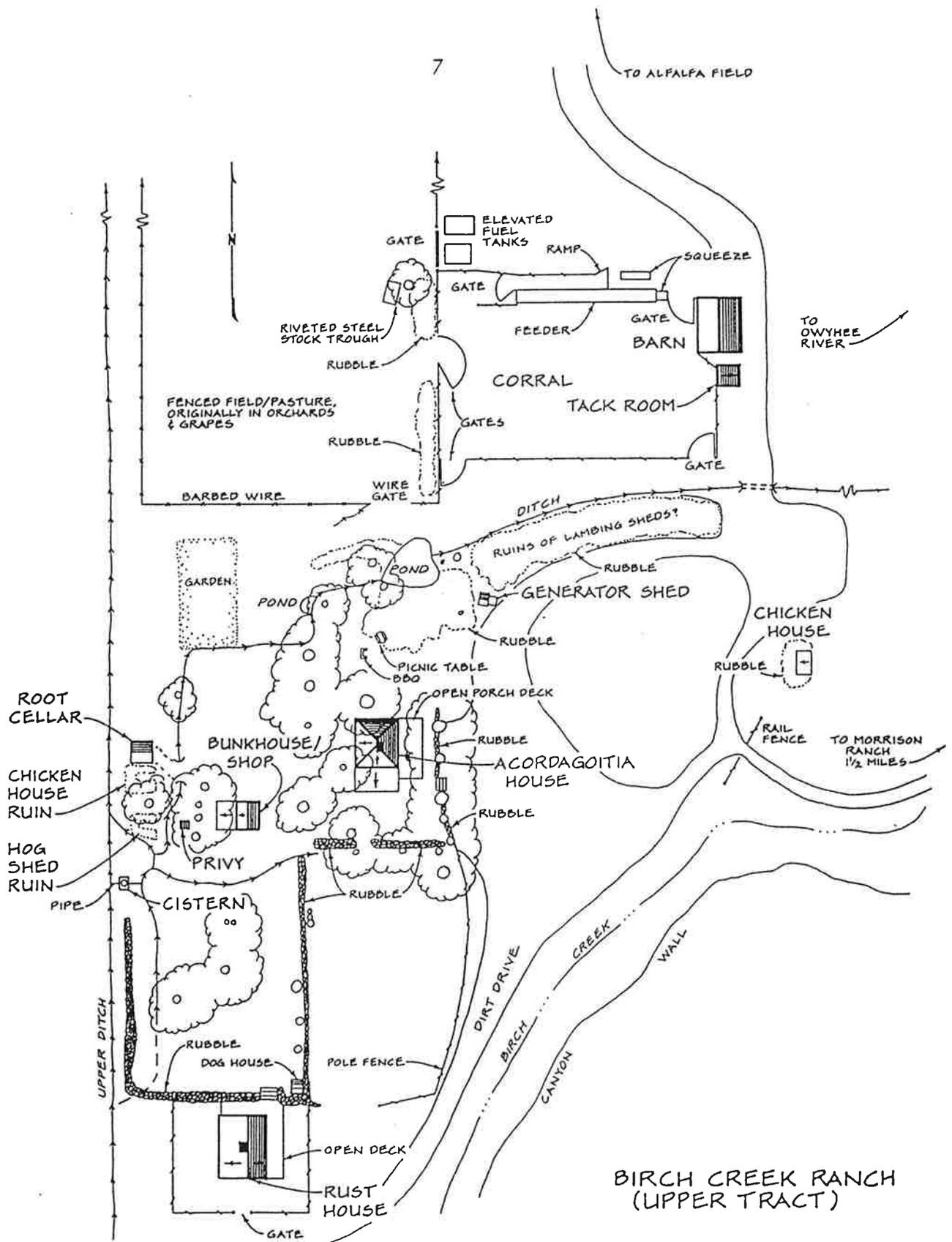


Figure 4. Birch Creek Ranch (Upper Tract) headquarters site plan (September 1995).

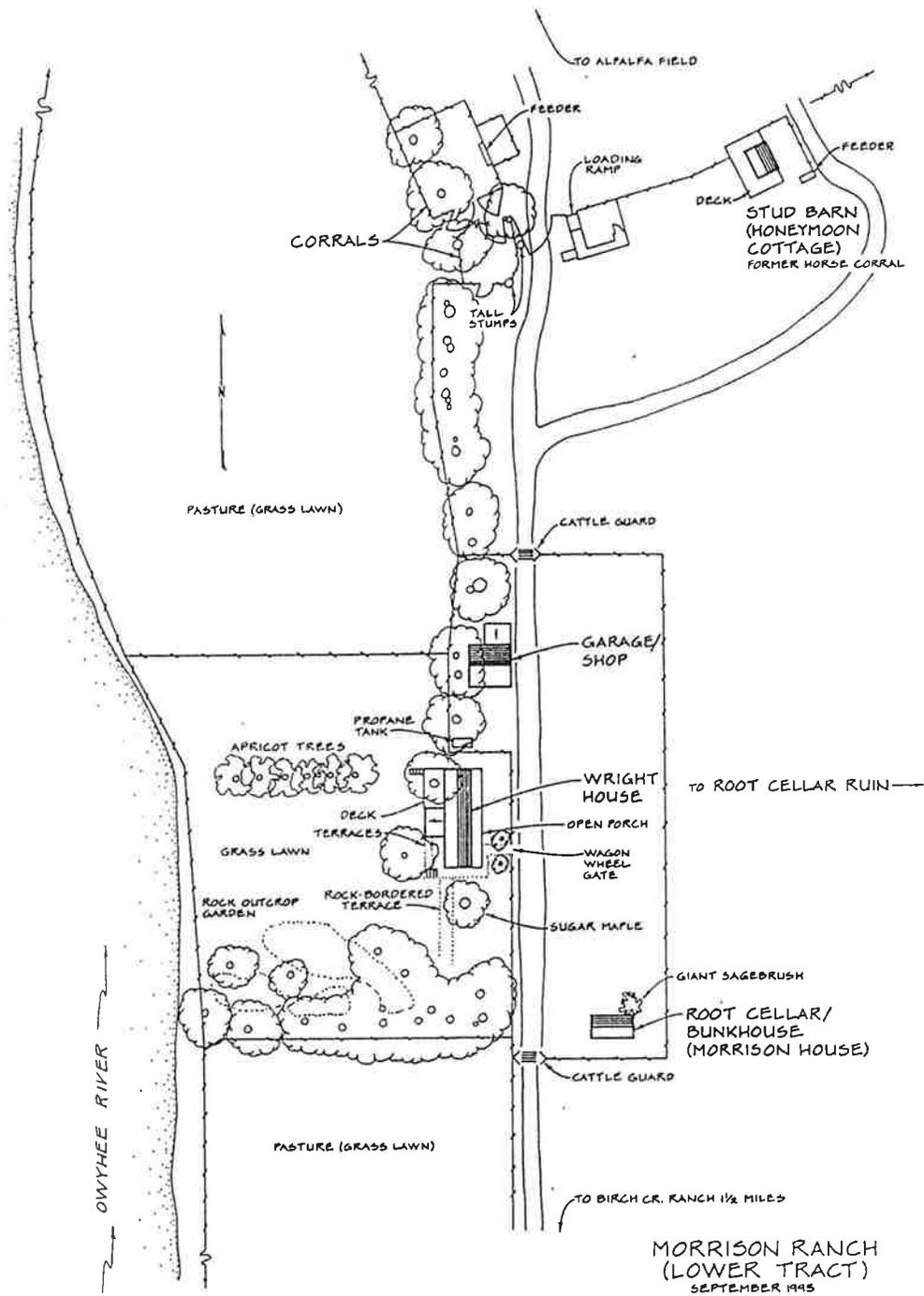


Figure 5. Morrison Ranch (Lower Tract) headquarters site plan (September 1995).

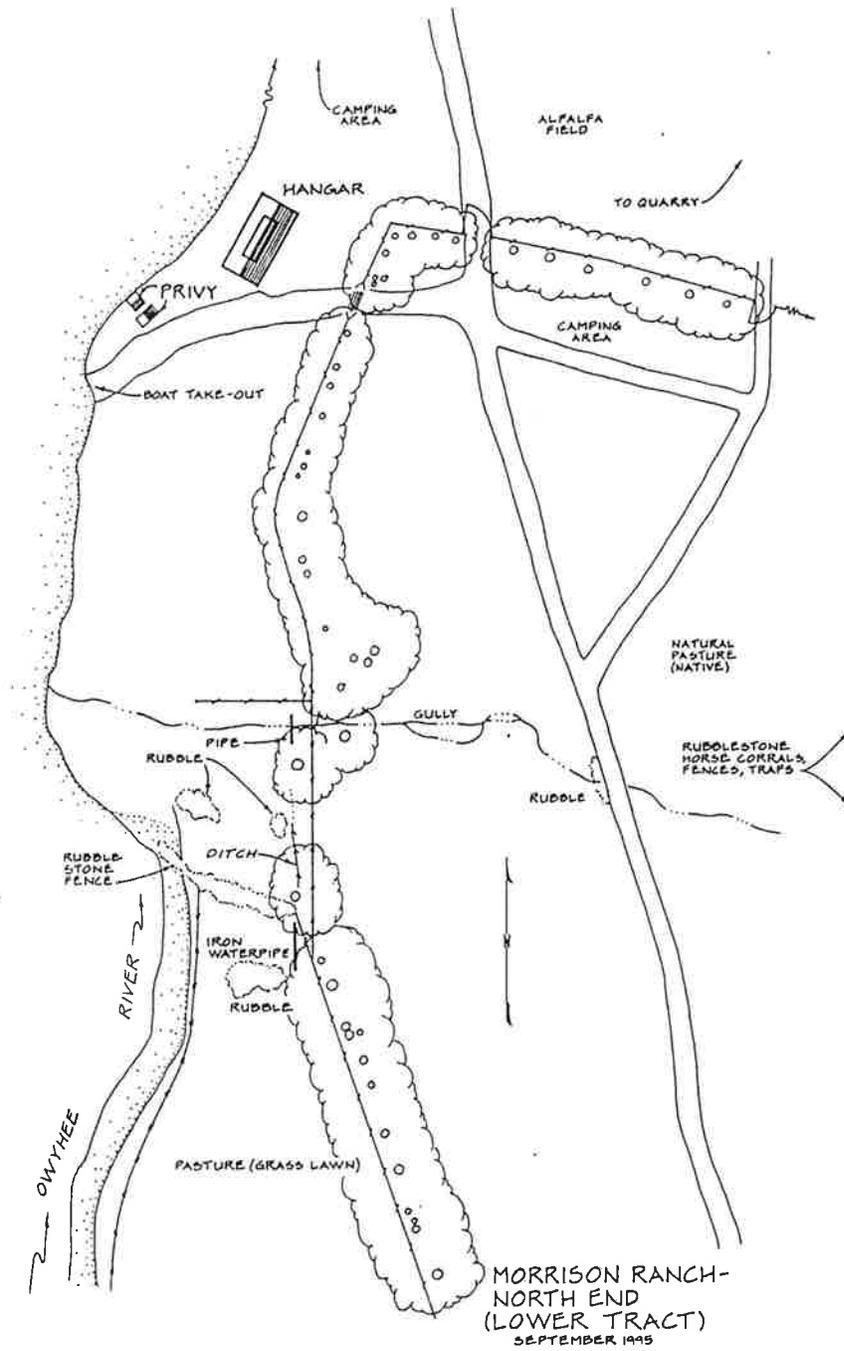


Figure 6. Morrison Ranch (Lower Tract) site plan of north end (September 1995).

learned the trade of sheepherding. He and his companion were originally hired by James Pickens "Pick" Anderson, one of the most influential cattle and sheep ranchers in the Winnemucca and Jordan Valley regions at that time (Hanley and Lucia 1980:103).

By 1889-90, Basques were migrating to the Snake River Valley and the Jordan Valley area to work in the nearby Idaho mines and in the sheep industry (Beers 1982:35-38). This migration was quite heavy throughout the 1890s until just after World War I, and Domingo Lequerica joined this movement into the Owyhee country at the turn of the century. Lequerica apparently lived in northern Nevada through 1898, returned to Spain following the Spanish-American War, and came to the Jordan Valley area shortly thereafter (Baker 1972:28). He was already established in the sheep industry and had staked a Desert Land Claim in the Owyhee Canyon on Birch Creek before 1903, because he had sent word back to Vizcaya, Spain for his son, Timothy, to join him. It is assumed then that Domingo Lequerica was living at Birch Creek Ranch probably no earlier than 1899. Tim arrived in the United States in 1903, but before Domingo could be reunited with his son, he was killed in a wagon accident descending the treacherously steep grade to Birch Creek Ranch (Beers 1982:52; Hanley and Lucia 1980:194-95).

J. R. Blackaby, local real estate promoter and owner of Blackaby's Mercantile in Jordan Valley, was designated as the administrator of the Lequerica estate and was thus assigned to dispose of the property. Tim Lequerica married in 1909 and went into partnership with Antonio Azcuenaga, one of the first Basques to settle in the Jordan Valley area, managing 12,000 sheep at Azcuenaga's ranch near Cow Lakes (Beers 1982:52; Hanley and Lucia 1980:187, 196). His father's Birch Creek Ranch was sold, along with water rights, in 1909 to Donato Uberuaga, one of the area's most respected sheep men, and Simon Acordagoitia. When the 1910 U.S. Census enumerator ventured into the Owyhee River canyon, Uberuaga--acknowledged as a "farmer"--and Acordagoitia--a "herder in sheep camp"--were the only two living at Birch Creek (Bureau of Census 1910). Uberuaga's involvement with the ranch property lasted only three years before he sold his share of the investment to Acordagoitia for nearly \$1,100 in 1912.

During the fall of that year, the federal cadastral surveyors of the General Land Office made their way through the Owyhee country noting the improvements Simon Acordagoitia and his wife Mercedes (who had then joined him at the ranch) had accomplished in the few years since settling on the property in 1909-10. These improvements included 40 acres of alfalfa, a half-acre of fruit-bearing orchard, over an acre of vegetable garden, and architectural improvements including a house, barn, sheds, and corrals (Collier and Joselyn 1912). The government surveyors specifically mentioned the extensive ditch system existing at Birch Creek Ranch for irrigating the

alfalfa field, orchard, and garden as well as a large current-driven water wheel and flume that was once located on the property. It was, for a large part, this watering system that made the ranch a success.

The Acordagoitias raised six children at Birch Creek Ranch before leaving the Owyhee River canyon in the late 1930s. The Depression was felt hard by the Basque people of the Jordan Valley vicinity, and a number of sheepmen lost all or most of their investment in the industry (Gaiser 1944:85). When the Bank of Jordan Valley failed during the 1930s, the ranching community's economic base was severely undermined. The sheep industry itself was declining even before the Depression hit, and the final blow, the passage of the Taylor Grazing Act in 1934, forced sheep ranchers to abide by rigid range restrictions and pay grazing fees. The Acordagoitias may have been one of those Jordan Valley area families economically affected by this turn of events when they sold their 123-acre Birch Creek Ranch for a mere \$2,000 in 1937.

The remains of the Acordagoitia's ranching heritage can be seen today everywhere in the surrounding landscape of Birch Creek Ranch. Though the ranch house itself was resided and reroofed in the last 20 years, the house retains much of its historic character in exterior form and interior spatial arrangement. The original historic windows still exist, though the porches were changed to match the recent alterations to the exterior of the house. A number of other early buildings and structures exist in fairly good repair. In addition to standing structures, the remains of those no longer extant are in themselves significant character-defining cultural features of the ranch.

Morrison Ranch (Lower Tract)

James Morrison, the owner and developer of the Lower Tract property, was born in West Virginia in 1876 and began a life of transience at the age of nine (Field n.d.:1). He was sent to live with his grandfather in 1885 a few years following the death of his father, and until he was old enough to set out on his own, he lived between Kansas, Illinois, and West Virginia. In 1891, at the age of 15, Morrison migrated to Sacramento, California, then to Carson City, Nevada, picking up what work he could. A few years later, he wound up in Harney County, Oregon, received an education (courtesy of his neighbors), and secured a job with the county superintendent setting type for the Burns *Times-Herald*. Morrison saved enough money to find a place of his own, and was off for Malheur County with the intent to homestead. He "struck the Owyhee" in 1899, and at 23 years old, began a solitary ranching career that was to last throughout the remainder of his life: "[The homestead]

happened to be a pretty good place. It was small, but I had cattle and horses. I had about 150 head of cattle at one time and about 100 range horses" (Field n.d.:3).

It may have never been Morrison's intention to permanently settle on the Owyhee River (he had been known to move around all his life) because he sold the ranch in 1919 to Tompie Scoggin for \$8,000, a deal that culminated in a lawsuit against the Scoggin family in 1923 for failure to pay up on the land:

I did get a couple thousand dollars out of them to start out. But they were people who couldn't do anything unless they were [on] horseback. They couldn't pay so I had to take the place back on a mortgage. Lost all my stock. One of my neighbors gave me a milk calf. It was the start of my new bunch of cattle. . . . Finally I got up to 75 head when I sold out this last time (Field n.d.:3).

Morrison then moved out of the Owyhee canyon to the Pasco, Washington area and bought land there on contract for a new ranch. He ranched and farmed for about 10 years, but the land was poor and his attempts to raise alfalfa for his stock ended in failure. In 1929, he once again obtained the title to the Owyhee River property from the Malheur County Sheriff and came back to his old ranch around 1932-33. He had his work cut out for him mending fences and repairing the irrigation water wheel that had fallen into disrepair while he was in Pasco, but money began coming in from the sale of his alfalfa hay. He proceeded to improve the property further by planting shade and windbreak trees and building up his stock herd.

James Morrison's original house is thought to be located a short distance downstream from the presently existing water wheel, between the river and the road. The remains of the foundation for some kind of a structure are still present at the site. Supposedly, when the house burned to the ground during the late 1940s, Morrison moved into the stone root cellar down the road and lived there until he sold the property in the 1950s to George Wright. In a conversation with Wright, the BLM ranch caretakers discovered that the core (now the kitchen) of what is presently known as the Morrison house is actually comprised of a house with several additions built upon it that was hauled upriver from the community of Watson, Oregon when the Owyhee Dam and reservoir were constructed between 1928-32 (Krause and Krause 1995). Wright said he added onto this smaller house at a later date (what is now the pantry and bathroom) and lived in this house, and that Morrison lived in the root cellar. When Martin Rust acquired the property in 1968, he completely renovated the house's exterior and interior and added the back bedrooms to Wright's construction.

The Morrison Ranch is rich in landscape features. The cadastral surveyors also noted that Morrison had an irrigation system comprised of a water wheel and ditches that supplied water to his pastures and alfalfa field. These are still intact on the property, as are the rows of mature locusts and elms Morrison planted some 60 years

ago. A number of other outstanding cultural features exist on the property, including the quarry where the building stone for some of the ranch structures was extracted, basalt rubble horse corrals and fences, wooden pole horse traps located high near the rim of the canyon, pastures, fields, and corrals all linking the human element of the landscape to the natural element.

CHRONOLOGY OF DEVELOPMENT AND USE

There are certain character-defining features to all of the architectural resources in the Birch Creek Ranch Historic Rural Landscape, namely the use of indigenous building materials and the manner in which they have weathered through time, the organic forms the buildings and structures take on, and their siting in the landscape. Most of the materials used in the construction of the buildings and structures in the Birch Creek Ranch Historic Rural Landscape were acquired either on-site or within the vicinity of the ranch. There is no record of a sawmill at the ranch, and presumably lumber (as well as building hardware) was imported from Vale or Jordan Valley to the property for construction needs, while all other materials were locally procured. Fine-grained volcanic tuff and rhyolite building stone was quarried at the north end of the Morrison Ranch. Owyhee basalt was used for the stone fences, corrals, rubble foundations, and some wall material and, even today, is widely available throughout the property. Juniper for the corrals and fence posts came from the gulches leading into the canyon. Unfortunately, the juniper was virtually depleted by 1912, so black locust was planted at the ranch to provide a store of fence-building material for future needs (Collier and Jocelyn 1912; Beckham 1989). With the exception of milled lumber, construction materials were readily available within the boundaries of the Birch Creek and Morrison ranches and could be fashioned on location into suitable components for architectural uses.

The forms of root cellars constructed into the sides of hills and curvilinear fence lines and corral enclosures that seem to emerge from the ground itself demonstrate the builders' attention to working with the land in determining where to build and how to create the most functional and practical structures necessary to daily ranch operations. The buildings themselves, though of simple rectangular forms, are clustered together and hidden in mature groves of trees and mock the concentration of native vegetation growing along Birch Creek and the Owyhee. They almost seem to compliment the monolithic formations of the canyon that surrounds them. The buildings have weathered to organic hues that blend-in with the scenery to convey a sense of connectedness with the land. The cultural and aesthetic significance of the Birch Creek and Morrison ranch buildings lies in this display of these character-defining features.

The following discussion provides a detailed review of each building's construction, materials, history of use, condition, modifications, and causes of deterioration. The figures referring to the photographs used to illustrate the current condition of the buildings can be found at the end of this section beginning on page 36.

Birch Creek Ranch (Upper Tract)

Barn

Physical Construction--The Birch Creek barn is a rectangular, two-story, light wood-framed (balloon frame construction) building measuring approximately 33 feet north-south by 17 feet east-west (Figures 7, 8, 9). It dates to at least 1912, since the cadastral surveyors noted it during their visit to the property during that year. The building has been painted red in the past. The foundation is composed of dressed and coursed stone masonry and appears to rest on a bed of gravel. A 5x5 sill, lap-jointed and nailed at the corners, rests atop the stonework on a cement bed. The wall is constructed of 3x4 studs 24 inches on center with a 1x6 ribbon on the east and west walls on the lower floor and a 2x4 ribbon on the north and south walls in the upper hay loft, a double top plate of 2x4s, 1x12 diagonal interior wall sheathing on the lower floor, 1x7 horizontal interior wall sheathing in the upper hay loft, and 1x6 horizontal exterior shiplap siding with corner boards. A water table separates the two stories on the outside of the building. The floor system includes 2x12 and 3x14 flooring at the bottom floor, 2x8 floor joists at the second story with cross bracing, and 1x5 and 1x6 tongue-and-groove flooring in the hay loft. Juniper posts bolted onto the floor joists above help support the upper floor load. The gable roof is constructed of 2x4 rafters 24 inches on center, variable-width skip sheathing (1x6 to 1x12 planks), and wood shakes over an earlier wood shingle roof.

A wooden ladder in the northwestern corner of the barn leads up to the hay loft. There is a hay hood, but no opening, on the north side of the barn. No hay fork mechanism was noted inside the hay loft, and there was no evidence that one ever existed. On the west wall of the loft is a door opening, but half of the door is missing. There are two window openings without sash on the west elevation; a fixed, single-pane, wood sash window on the south; and a two-pane, wooden sash window without glass covered with chicken wire on the north. Z-braced, wooden batten doors exist on the south side at the southwest corner (single-width), on the east side, and the north side (both doors are double-width with large strap hinges--Figure 10). The door on the north side is a "Dutch" type, with the top half opening independently from the lower half, and is constructed of double thickness with a layer of newspapers between the two thicknesses of planks.

A corral, loading chute, squeeze chute, and water trough exist to the west of the barn. A separate tack and grain storage building lies on the south side of the building. The barn is situated on a flat site with the river bank gently sloping down to the north and into the water. A dirt road leading west and north to the upper alfalfa field lies on the north and east sides of the barn.

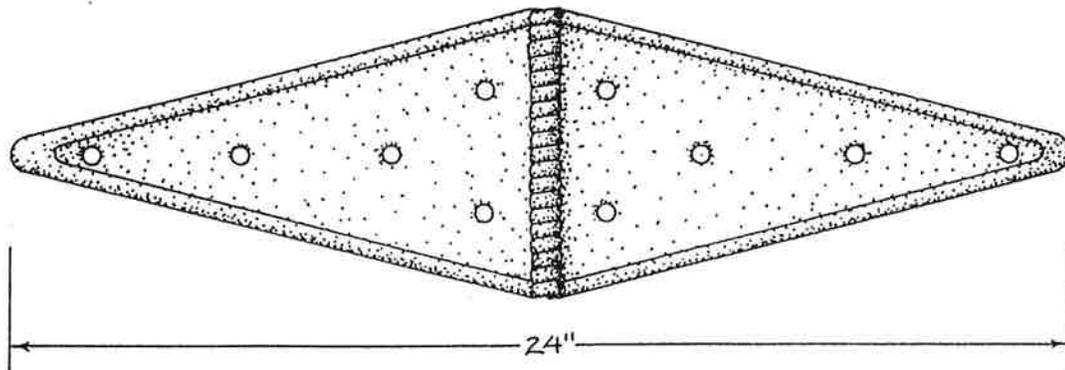


Figure 10. Typical strap hinge used in the construction of the barn.

Use--The lower level of the barn formerly accommodated the feeding and temporary sheltering of livestock and horses. A feed trough runs along the entire west wall of the barn, and two stalls are presently evident (there may have been a third stall at one time). A separate space occupies the south end of the barn and is closed off from the animal area by a horizontal board partition and a single-width door. This space was (and is still) used as a tack and grain room. Bridles, rope, barrels of grain, saddles, blankets, and saddletrees now occupy this space. The upper story of the barn was used for hay storage, and some hay is still stored in the loft.

Tack Room

Physical Construction--The tack room building is a simple light-wood-framed, shed-roofed structure facing west into the corral area and measuring eight feet-six inches north to south by eight feet east to west (Figure 13). It appears to have been constructed from available materials on the ranch; some of these may have been recycled from buildings no longer standing. The building sits on a 2x6 sill and a basic foundation of dressed local stone and rubble stone footings. The walls and roof are framed with 2x4 studs and rafters. There is no exterior siding, but the interior walls and roof are sheathed with 1x5 tongue-and-groove horizontal boards. The floor is

plywood, and the roof is covered with newer wood shakes. Several flattened Prince Albert tobacco tins, tin can lids, and small pieces of sheet metal cover knot holes on the interior walls. A single Z-braced batten door is constructed of 1x3 vertical boards. Three four-inch-diameter cross-sections from small trees are nailed to the inside of the door for hanging bridles and rope.

The tack room lies within a few feet of the south side of the barn on a flat site and is incorporated into the space of the corral. The dirt road leading to the upper alfalfa field passes the building to the east.

Use--The tack room was initially used to store bridles and other tack. It is presently used to store barrels of grain, and all tack and saddlery have been moved to the tack room inside of the barn.

Bunkhouse/Shop

Physical Construction--This gable-roofed, one-story, rectangular building is constructed of light-wood framing (stud wall) and rests on a rubble stone foundation (Figure 16). The exterior cladding is board and batten, and some square nails and what appear to be rosehead nails were used to attach the battens to the boards. The roof is covered with wood shakes over building paper on the main portion of the building and wood shakes over rolled asphalt roofing over the shop addition. The bunkhouse/shop was once painted red. The rafters are not exposed to the outside of the building but can be seen through a north gable entry to the attic. They are widely spaced, at least 36 inches on center. A shed-roofed addition, used as a shop, exists on the west side of the building and illustrates the use of box, or plank wall, construction (Figure 17). The entire building measures 22 feet east-west by 18 feet north-south with the rear (west) 12 by 18 foot shed addition. The gable ridge is oriented north-south.

The facade (east side) is adorned with a three-panel-and-light decoratively carved wooden door flanked by two wooden sash, horizontal slider windows: an eight-pane window on the south side of the door and a two-pane window on the north. Rubble stone is laid about three feet out from the front of the building and kept in place with railroad ties. A slab of cut stone functions as a step into the front entrance of the bunkhouse.

There is a wooden ladder leading to a small door in the north gable end of the bunkhouse/shop that leads to attic storage space. Another three-panel-and-light decoratively carved wooden door on the north side of the building leads into the shop area. A four-pane, fixed window exists on the west side of the shop addition (rear of the building), and a two-pane horizontal slider window is found on the south side. Mature trees surround the bunkhouse/shop on the south and west sides. On the south

side, near the southeast corner, is a propane tank and stove pipe. A water spigot lies off the southeast corner in front of the building.

Some of the original interior finishes of the bunkhouse/shop have been covered over through time. Both the walls and ceiling are covered with modern gypsum board. The floor in the entry room is covered with three-inch tongue-and-groove boards laid diagonally, while the floor in the side room to the north is covered with linoleum. A newer woodstove sits along the south wall of the main entry room.

The shop section of the building is divided from the bunkhouse by a stud wall and a Z-braced batten door constructed of tongue-and-groove lumber with a ceramic door knob. The shop has a dirt floor with a raised platform of plywood along the south wall. There is an old woodstove near the northwest corner on the north wall by the door. A blacksmith anvil and bellows still remain in the shop near the woodstove, and a workbench runs along the length of the west wall. Shelving and compartments to hold nuts, bolts, and other hardware take up half of the east wall from the southeast corner north. A newer plywood workbench runs along the south wall. The entire building is wired for electricity.

The bunkhouse/shop sits on a level site and is shaded all day by mature trees planted in a row behind the building. The surrounding yard is dirt. An irrigation ditch runs to the west of the building, and an outhouse (privy) lies just a few yards to the west, between the bunkhouse/shop and ditch.

Use--The bunkhouse/shop is thought to be the first dwelling erected at the Birch Creek Ranch (Upper Tract) and may be associated earliest with Domingo Lequerica. After the property was sold to Donato Uberuaga and Simon Acordagoitia in 1909, it is not known whether either or both men lived here before the large house was constructed to the east. Since Acordagoitia was married, he and his wife, Mercedes, may have had the large house constructed for them and Uberuaga may have lived in the bunkhouse. It is not known if the shop section of the building was always used as a shop. At present, the bunkhouse is being used as an office, and the shop is still used as a shop.

Chicken House

Physical Construction--The chicken house is a shed-roofed, light-framed, wooden structure oriented north-south and measuring nearly 13 feet square (Figure 19). It is constructed at grade along the east (front) side, but the west side, northwest, and southwest corners are excavated into the ground. Local rubble stone was used for a foundation and a partial wall two to three feet high from the dirt floor. Rubble stone is mounded around the exterior of the structure as well. The framed portion of the

chicken house rests on large, saw-cut, squared sills measuring 10x10 on the north and south walls, 7x10 on the east wall, and 5x5 on the west wall. The west wall sill is also comprised of a five-inch diameter locust log. The north and south sills extend out from the structure one-and-a-half to three-and-a-half feet and are notched (sawn) to accept the east and west sill members. Anchor bolts were used to attach sills to bottom plates.

The framed portion of the chicken house walls are constructed with 2x4s using bottom and top plates and studs, except for the west wall. Nail holes in these and other 2x4 members in the chicken house strongly suggest they have been salvaged from another building and reused in the construction of this structure. The walls are composed of horizontal board sheathing and vertical board shiplap and matched board exterior cladding on the north and south sides. The west wall is constructed of vertical board sheathing and both horizontal tongue-and-groove and beveled shiplap siding. The roof is supported by 2x4 rafters 26 inches on center with 1x12 and 1x5 board sheathing. Remnants of asphalt composition shingles which once covered the roof are evident. An interior chicken roost constructed of three-inch diameter vertical poles atop stone footings and half-sawn horizontal poles helps support the roof structure.

The east elevation (front) of the chicken house is enclosed only with chicken wire attached to 2x4 studs. A single-width board and batten door with a top-hinged chicken door at the bottom exists at the northeast corner. The door is constructed of 1x7 and 1x9 vertical boards with 2x4 cross battens and fastened to the structure with standard, ferrous metal strap hinges. There are window openings on both the south and north walls. The windows are casement, but most of the sash is missing except for the casing where hinges are still attached. These hinges are of the same style as the chicken door hinges (Figure 20).

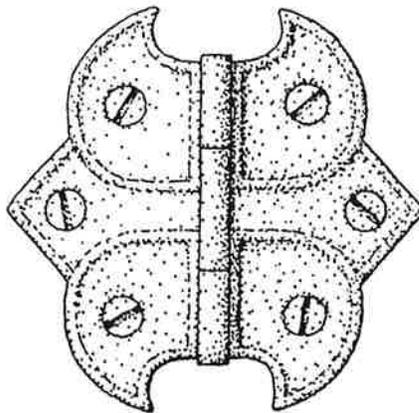


Figure 20. Type of hinge found on chicken house windows and hen doorway (not to scale).

Boards have been nailed across the windows on the exterior of the building. The chicken yard itself is no longer demarcated or discernable.

The chicken house is relatively isolated from the rest of the building group and is situated on an open, sloping site (downhill west to east) at the far eastern edge of the ranch complex. The dirt road leading to the upper alfalfa field passes the structure on the west side, and a small parking area lies to the north. The road to the Morrison Ranch is to the south a few yards away. Sagebrush and grass grow abundantly around the structure.

Use--The chicken house is a later addition to the building group at Birch Creek Ranch and is the second to be constructed on the property. The original chicken house was located to the south of the root cellar (see Figure 4). Only a pile of rubble remains at this site. The BLM caretakers were told by informants that the sill members used in the construction of this building were salvaged from an old "rock boat" that was used to haul the rubble stone to various building sites, particularly the stone fences, around the ranch property (Krause and Krause 1995). They were told that this chicken house was constructed sometime during the 1940s to replace the earlier structure. Currently, the structure is not being used.

Root Cellar

Physical Construction--The root cellar is a rectangular, gable-roofed, load-bearing masonry building 23 feet long (east-west) by 17 feet wide (north-south) with 24-inch thick walls (Figure 24). It is constructed into the slope of the hill to the west. Dressed and coursed local stone characterizes the front (east) of the building, while randomly placed rubble stone was used for the other three sides. The south side is almost completely hidden with the rubble stone from the adjacent chicken house ruin. The roof is constructed of two-inch dimension lumber for the top plate and rafters and one-inch lumber for the roof sheathing. The roof is covered with wood shakes. A square, wooden box vent exists atop the roof ridge near the west end of the building. The main irrigation ditch from Birch Creek leading to the upper alfalfa field far to the north runs along the contour of the hill slope just above the root cellar.

There is a single entrance on the east side with two separate board and batten doors, one on either side of the stone wall, creating a 24-inch dead-air space between the two doors. The interior door is covered with a single layer of black building paper. Between the doors is a four-foot high wood and wire screen door. A single window exists on the north side of the building that has been boarded over on the inside. Food storage shelving lines the inside of the building on the south, west, and north sides.

The root cellar is partially shaded by mature trees and sits on a gently sloping site to the north, west, and south and a steep slope up to the west. The structure blends in well with the surrounding landscape. Immediately in front of the building (to the east) the surrounding yard is dirt, but on the hillside behind it grows grass. There is another ditch in front of the root cellar that waters the garden to the north.

Use--This building is one of the earliest architectural features constructed at Birch Creek Ranch and probably dates to around 1910, shortly after Simon Acordagoitia acquired the property. It has always been used as a root cellar.

Cistern

Physical Construction--The cistern is constructed of large aggregate concrete faced with rubble stone (Figure 28). The top of the structure is finished with cement parging and is shaped in a truncated pyramidal form. A wooden lid sheathed in galvanized sheet metal covers the cistern's opening at the top. The cistern is four feet square on the inside with walls one foot thick and is constructed into the side of the hill. The cistern's depth is 14 feet, though only seven feet of the wall (east wall) is exposed above ground.

The cistern is filled with water drawn from the main Birch Creek ditch located above and on the west side of the cistern from a PVC hose. The main out-take is a galvanized pipe fitted with a water-control valve on the east side near the bottom of the structure. An overflow pipe and hose of PVC exits the cistern on the east side just below the lid. The PVC hose empties water into the irrigation ditch system that meanders through the Birch Creek Ranch yard. The galvanized pipe is attached to other PVC hoses and metal pipes that distribute water to other portions of the ditch system. The flow of water is controlled by valves.

The cistern is shaded all day by young trees. Bushes and grass also grow around the structure. It is constructed on a steeply sloping site (uphill east to west) and blends in well with its surroundings.

Use--The cistern is part of the gravity-fed water system and is the primary supply tank formerly used for drinking water and irrigating the Acordagoitia house yard and garden. The date of construction is not known at this time but was likely built by the Acordagoitia family during the 1910s or 1920s. The cistern is used today for the storage of water only for irrigation and is an integral component of the irrigation works at the ranch.

CISTERN-ELEVATION SEPTEMBER 1995

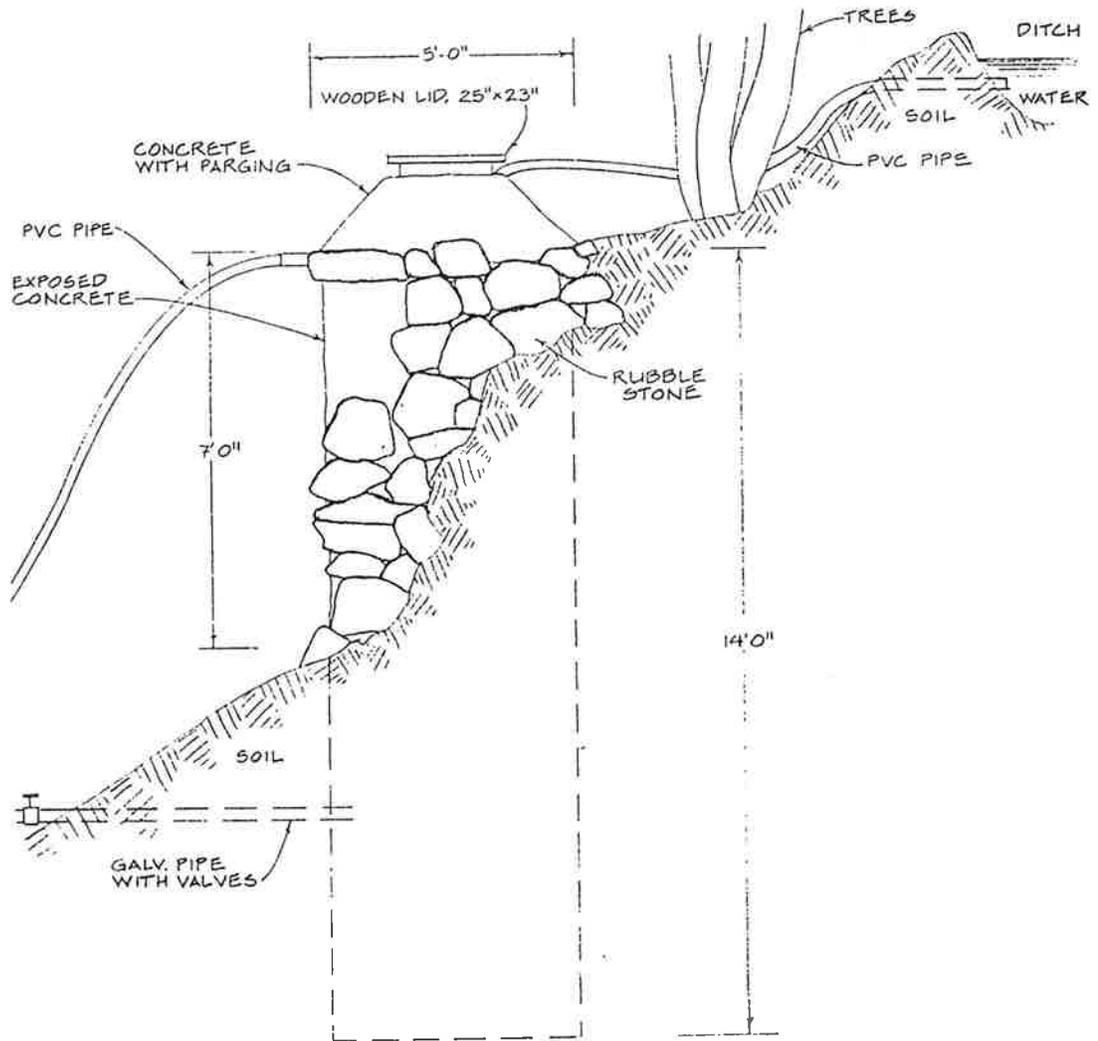


Figure 28. Birch Creek cistern, sketch of north elevation (not to scale).

Generator Shed

Physical Construction--The generator shed is located on a slightly sloping site at the west edge of a rubble pile thought to be the ruins of old lambing sheds. A modern decorative pond lies about 25 feet off the northwest corner of the shed. Mature trees shade the shed's west, south, and north sides. This small, shed-roofed building is constructed of vertical boards and battens forming the walls, 2x4 rafters, beaded tongue-and-groove roof sheathing, a wood shake roof (over composition shingles), and plank flooring on 4x4 joists, a 3x10 sill, and a rubble stone foundation (Figure 31). The shed appears to have been constructed from recycled building materials. The building itself measures six feet by four feet with an additional four feet of floor deck outside of the entrance (east side). Its height is six feet on the east side and just under five feet on the west side. A single opening exists on the east side. There is wooden shelving on the inside along the south wall, a generator along the north wall, and 12-volt batteries along the west wall. The area around the generator is soaked with oil. A section of flexible metal conduit is attached to the generator and goes through a hole cut in the north wall to the outside of the shed where it is buried under rocks. Another hole is cut on the east side as a vent for the generator. There is a solar cell panel attached to the south wall just under the roof.

Use--Because of its rustic nature and construction materials, the generator shed was erroneously thought to date to the historic period at the time the National Register nomination was drafted. Subsequent to the initial investigations leading to the writing of the National Register nomination, it has been discovered that the shed may be a more recently constructed building at Birch Creek Ranch and is thought to have been built during Martin Rust's ownership of the property (after 1971). Mr. Rust supposedly had the shed erected exclusively for sheltering a modern generator that was used for electrifying some of the buildings at the ranch (Krause and Krause 1995). The generator is still in use today.

Outhouse (Privy)

Physical Construction--The outhouse is a three-sided, shed-roofed, plank-framed building measuring four feet by three feet and is located behind (west of) the bunkhouse/shop, facing west (Figure 32). The site is flat, and the surrounding yard is dirt. A row of mature trees to the east shades the privy all day. The irrigation ditch that waters the garden flows a few yards to the west.

The outhouse does not appear to have ever had a framed door. The plank flooring, which extends beyond the walls, rests directly atop a rubble foundation, and additional rocks have been placed on top of the floor outside of the building to stabilize the structure. The roof is constructed of 1x12 planks and rolled asphalt sheets.

There is a bench with a conventional toilet seat and lid along the east wall. The walls, inside and out, as well as the floor have been painted white (or whitewashed). There are two rusted coffee cans on the bench to the north of the seat. Two sheets of plywood are nailed onto the front of the bench. Rolls of toilet paper are hung on wire high on the south wall. The outhouse may have been cleaned out regularly, since there is a small opening (now covered and nailed shut) at ground-level on the north wall near the northeast corner.

Use--The National Register nomination suggests this was the original Birch Creek outhouse, and no new information was found to negate this association. The building is not presently being used as a privy.

Morrison Ranch (Lower Tract)

Root Cellar/Bunkhouse

Physical Construction--This root cellar/bunkhouse, measuring 25 feet by 11 feet and oriented east-west, is constructed of masonry bearing walls of dressed and coursed local stone and random rubble stone (Figures 33 and 34). The craftsmanship of the dressed stone is very similar to that of the Birch Creek Ranch root cellar at the Upper Tract, and it is conceivable that both buildings are the work of the same mason. The building has a gable roof and wood-framed roof system, incorporating 4x7 purlins (rather than rafters), five-inch tongue-and-groove sheathing, and wood shakes. The roof rests on a cement mortar bed on top of the walls. The building is partially subterranean and is entered at grade on the north side near the northwest corner. The door is decorative, constructed of three-inch tongue-and-groove boards and wrought-iron-like strap hinges, door latch, and key hole plate. There is a concrete pad in front of the door and a decorative lamp to the side. Two modern single-pane, casement windows exist on the south side of the building. The sill for the window opening farthest to the east is fashioned from flat field stones. Two soil stacks and two heater ventilation stacks pierce the roof. A propane tank sits under the eave on the east side of the building.

The interior is divided into two rooms: a sleeping space with bunkbeds and a full bath. The floor is carpeted, but the walls in the sleeping room are exposed masonry. The masonry walls in the bathroom are covered with modern finishes. There is a small wood stove in the northeast corner of the sleeping room and propane lamps fixed to the walls throughout. The bathroom is modern and is equipped with running water. Both windows (one in each room) are operable.

The surrounding yard is nearly free of vegetation with the exception of a large sagebrush bush off the northeast corner. A pole fence exists 17 feet to the south and east of the building. The root cellar/bunkhouse is reached by a series of railroad tie steps from the road curving up to the building. The site gently slopes up to the south and east, down to the north and west. The land continues uphill to the east to the shear rock walls that characterize the canyon.

Use--This building is thought to have been originally used as either a root cellar and/or a bunkhouse for the Morrison Ranch. Though the construction is the same as the root cellar for the Birch Creek Ranch at the Upper Tract (the only type of building found on the entire property employing dressed masonry in its construction), the fact that this building has two window openings that appear to be part of the original design, and that it is not constructed more into the ground or in the side of a hill, leads one to believe that it was used as a bunkhouse rather than a root cellar. (Another root cellar of more typical construction and siting exists on the property above this building to the east at the base of the canyon. See "Stone Dugout/Root Cellar Ruin" section below.) George Wright, who purchased the property from James Morrison, told one of the BLM ranch caretakers that James Morrison himself moved into this building when his first house, which was located just above the river a short distance downstream from the water wheel, burned to the ground during the late 1940s (the foundation remains of this house are still visible). Morrison apparently lived here until he left the property for good around 1958 (Krause and Krause 1995). It is not known what the building was used for after Morrison vacated it, but it was completely rehabilitated to serve as a guest cottage soon after Martin Rust acquired the ranch in 1968. Mr. Rust replaced the door, windows, and entire roof system.

Garage/Shop

Physical Construction--This gable-roofed, wood-framed building was constructed almost entirely from used and recycled building materials (Figure 37). It is framed with a variety of lumber, including 2x4 corner posts, girts, diagonal wall bracing, and rafters; 4x4 posts and top plates; 2x6 collar beams and roof ridge beam; 1x6 skip sheathing for the roof; and 1x12 vertical boards cut at five-foot lengths for the siding. A single juniper post in the center of the building helps support the ridge beam. The roof is covered with corrugated metal. The foundation is comprised of both rubble stone and dressed stone footings with a 4x6 sill, and the floor is dirt. There is a large sliding door hung on cast iron rollers on the east side, a three-pane window that slides to the side on the east wall, and one other four-pane window that slides to the side on the west wall. An array of deer and elk antlers adorn the east side of the building in the gable. A mummified steer head is mounted near the northeast corner on the north side as well. The building measures just under 19 feet square and is oriented east-west.

There is a work bench along the east wall between the door bay and the northeast corner of the building. Newer shelving exists along the north wall near the northeast corner, and other shelving exists on the south side of the building. Old horse tack, irrigation hardware, pulleys, and other older shop hardware are hanging on all of the interior walls. The year "1931" is painted in yellow on the south wall near the southeast corner next to a raised platform frame.

A shed-roofed addition, measuring six feet by 14 feet, exists on the north side of the garage/shop (Figure 38). It is minimally constructed of recycled materials (2x4 studs, girts, and rafters, cove/drop shiplap siding, skip roof sheathing, and wood shingles) and is completely open on the east side. The 2x4 sill plate appears to rest directly on the ground, however, footing stones may be buried underneath the sill. Two windows exist in this addition: a four-pane window on the north side that slides up, and a two-pane window on the west side that also slides up. Firewood and broken redwood patio furniture is piled along the west wall of the addition.

The building is situated on a flat site just north of the non-contributing building known as the "Morrison House" and is shaded by mature elm and locust trees lying within 10 feet of the west and north sides. A pole fence runs parallel to the west on the other side of the line of trees. The building site is level and is devoid of vegetation other than the trees. An old horse pasture (now an irrigated grass lawn) is to the west.

Use--James Morrison used this building as a shop and garage, and it is likely that he constructed it. Local informants have mentioned to the BLM caretakers that Morrison built the existing water wheel that is still intact upriver just outside of this building. The BLM is presently using the building as a workshop and for equipment and hardware storage.

Stone Dugout/Root Cellar Ruin

Physical Construction--This feature is comprised of the remains of a former root cellar (Figures 40 and 41). It is constructed of two masonry bearing walls (north and east) against the face of a rock outcrop (south) and an earthen berm wall (west). The interior space measures approximately 16 feet long by seven feet wide by eight feet deep. The exterior surface of the masonry walls is buried within an earthen berm. The structure no longer has a roof (no remains of the roof can be found around the cellar), but a cross-braced batten door and part of the door framing still exist in place on the north side. The door framing is bolted onto cut stone blocks. The floor of the structure is covered with grass and fallen rubble from the walls but appears to be of earthen construction. The lower masonry units are dressed and coursed local stone, while the masonry closer to the top of the structure is coursed rubble stone. The craftsmanship and materials are similar to other stone buildings at both the Morrison

and Birch Creek ranches. The masonry walls are nearly nine inches thick with an additional four feet of earth fill on the outside. There is a section of an eight-inch diameter cast iron pipe cemented to the rock face, the function of which is not known. Wooden poles, some with wire attached to them, lay in a small pile off the east side of the cellar.

The site is cool, damp, and well shaded for the majority of the day, and the building is well camouflaged by the surrounding landscape. Grass and sagebrush grow in abundance all around the building. The terrain is sloping down to the west and north and up to the east. The rest of the ranch buildings are approximately 400 feet to the west of this ruin.

*Use-*Based on construction and siting, this structure appears to have been used as a root cellar or store room historically. It has not been used in this capacity for the last 30 or 40 years and has been in a state of ruin since then.

PHYSICAL DESCRIPTION

Recording the physical description of each building and structure requires actual in-field inspection and involves a thorough documentation of present condition, structural adequacy, and causes of deterioration. Noting any modifications to the original design of the building (additions, replacement of historic fabric with modern materials, general building maintenance such as masonry repointing, etc.) is especially important, because these modifications could indicate an attempt at remedying previous structural problems or even the cause of present structural failure or the decay of historic fabric.

Birch Creek Ranch (Upper Tract)

Barn

*Condition/Modifications-*Damage to the northeast corner of the barn was incurred during the March 1993 flood, and the foundation on the north side of the building was partially undermined, exposing the bed of gravel on which the foundation stones rest (Figure 11). According to the caretakers, the water level was up to four feet inside the barn. At the time of this writing, nothing has been done to repair this damage.

All modifications to the barn appear to have taken place during Martin Rust's stewardship of the property between 1971 and 1988. The barn is very sturdy and

structurally sound, and the roof is in good condition; however, the flood did cause some settlement of the building. The roof rafters have been strengthened recently with collar beams, probably added when the new wood shakes were nailed over the barn's original wood shingle roof. Also recently, the hay loft floor has been additionally supported by fitting two five-inch diameter poles with a 3x5 horizontal brace nailed to the poles under the floor joists. These poles, however, are presently not supporting the full load of the floor and are easily moved by hand. Settlement of the structure likely took place when flood waters receded.

Some buckling of the lower level floor is evident, but the floor itself is very solid. Flood damage is most evident in the far south end of the barn in what is now the tack room. Another five-inch post was added to this room but is not attached to the floor joist above. The joist, which is cracked, is not even resting on the post. The floor is extremely bowed in this room but is still solid. The sill here (south wall) shows displacement from the foundation, and rot from contact with the soil is quite evident. The most damaged section is in the middle of the wall; it is buckling outward from the ground up.

The lower two to three horizontal exterior siding boards are damaged due to weathering and saturation from seasonal precipitation. Exterior examination shows deterioration of the sill on the west, south, and east sides where it has come in contact with the foundation (Figure 12). Dirt has accumulated and piled up on the foundation, and in the past has held moisture and has saturated the sill. The portion of the sill on the north side appears to be in much better condition. The south side of the barn suffers the worst weather, and the exterior siding is the most weather-beaten here. The southwest corner is bowed outward.

On the interior, soil has accumulated along the feed trough where it touches the west wall. Some rot was noted here due to seasonal saturation. The barn is infested with packrats and mice, especially on the first floor.

Causes of Deterioration--The primary causes of deterioration of specific elements of the Birch Creek Ranch barn are natural weathering and the effects of moisture being retained in the soil that has built up along the foundation and sill of the building. Inadequate site drainage contributes to the deterioration caused by seasonal moisture. The effects of wind, sun, and precipitation have all played a part in the decay of some materials.

Tack Room

Condition/Modifications--This building is in poor condition and is leaning to the east. A preliminary building inspection of the tack room in 1992 reported that the

building was in poor condition and was being propped up on the north side with 2x4 lumber to prevent it from falling against the barn (Chappel 1992). Temporary stabilization of the structure was completed by the BLM at the recommendation of the report; however, at the last inspection of this building in September of 1995, it was still in poor condition (Figure 14). The south and west sides, those most exposed to the prevailing weather, are the most deteriorated. The wall system is failing because the studs lack structural integrity due to deterioration. The studs on the north wall have been anchored to the sill with iron hangers, but the attachments are failing. On the south side of the building, the studs have little structural integrity and have been diagonally braced to help stabilize the wall. The strap hinges holding the door to the wall are very loose.

During the flood of 1993, the tack room was inundated with four feet of water. Debris from the flood collected under the building, and dirt is presently in direct contact with the sill. On the south side, dirt is packed along the wall at a level above the floor (Figure 15). The roof is in good condition, however, and the floor seems to be solid as well. The building is infested periodically with rodents, as well.

Causes of Deterioration--The primary causes of deterioration of the tack room are structural inadequacy due to poor original construction, natural weathering, and the effects of the 1993 flood. Wind, sun, and precipitation have all played a part in the decay of some materials. Poor site drainage is also a factor in materials deterioration.

Bunkhouse/Shop

Condition/Modifications--There is evidence of some rot and decay where wood members come in contact with the stone foundation on the north side near the northeast corner. On the east side, the sill is weathered but solid. The south side of the building receives the most brutal effects of weather, and it is on this side near the southeast corner where the siding has deteriorated/eroded at the point where it comes in contact with the soil (Figure 18). Soil has built up along the south side and, in some areas, the flooring appears to be in direct contact with the soil. The exterior siding in general is in good condition except where it comes in contact with the soil.

The large two-pane window that leads into the shop on the south side of the building is a later replacement of a smaller window (perhaps during the late historic period). A two-foot section of gravel along the west side of the shop may be a recent improvement to increase site drainage. There is evidence of moisture damage where the bottom of the exterior siding comes in contact with the soil. All windows in the shop addition are in need of putty.

The roof sheathing on the shop addition is noticeably rotten. The building was reroofed with wood shakes within the last 20 years, and this rot could be older evidence of deterioration that took place prior to reroofing. The roof of the shop is sagging, indicating that the 2x4 rafters are not adequately carrying the load of the roof.

The floor in the bunkhouse section is solid in the main entry room but is slightly sagging and spongy in the north room. The joints where the gypsum ceiling sheets come together have widened, possibly the result of structural settlement. The front (east) door is solid and in good condition but needs painting. The window in the door was recently caulked with silicon sealer, rather than traditional glazing putty. The windows on the east side are all in good condition.

The window of the exterior door to the shop addition is missing and has been covered with clear plastic, and the knob and knob plate on the door are both loose. The door needs painting, as well. The 2x4 rafters inside are deflecting the weight of the roof, perhaps from the increased weight of the new wood shakes. The plywood platform in the south end of the shop is deteriorated and not strong enough to carry much weight. The electrical system of the bunkhouse/shop, however, was recently upgraded in the last three years.

Causes of Deterioration--Poor site drainage, inadequacy of structural members (such as the rafters in the shop area), building settlement, natural weathering, and lack of upkeep and basic maintenance in the past are the prime causes of building deterioration of the bunkhouse/shop.

Chicken House

Condition/Modifications--The foundation and rubble stone walls of the chicken house are in good condition, the rubble being stabilized by earth all around. No apparent buckling or bulging is evident. The sills, however, are all deteriorated, though the south wall is in a little better condition. The deterioration is best detected on the interior of the structure. The south sill is rotten on top in several places, especially in the southwest corner. Decay from moisture and weathering is evident, but the sill is still solid regardless of this noticeable deterioration (Figures 21 and 22). This is most likely damage that occurred in the past and may not be an active problem today. The sill logs were recycled to be used in this construction and were probably of lesser integrity at the time they were first put in place for this building.

The log sill on the west side has shifted and become dislodged. Some of the same old moisture damage and weathering is evident at the north end of the sill log. The other portion of the sill near the northwest corner is a log wedge that is not very secure, although the wedge itself is solid. The bottom plate on the east side in

particular is greatly deteriorated. Rot is not apparent in the bottom plate on the west wall, however, the condition of the sill has caused this wall to sink down toward the northwest corner. The top plate has deflected under the shift of the weight. The north side sill is rotting on the outside exposure on the underneath side where moisture tends to build up and get trapped. The wood here is very deteriorated and flakes off when probed with a knife. The entire portion of the sill that is exposed to the outside is badly rotten, and in one spot is decayed all the way through, and the anchor bolts are exposed. The bottom plate on this side, however, is covered by vertical siding on the exterior and is protected from the effects of weather.

The wall studs on the east side have little structural integrity and are cracked and buckling. The east wall top plate is weathered but is functioning. The studs on the north side are warped under the load of the roof and are cracked. There is nothing left of the window sash, but the window hinges are still attached to the window framing. The top plate on the north side is cracked near the northwest corner, and dirt has accumulated in this corner at the floor level, possibly from rodent disturbance. The rafters of the chicken house are all bowed and cracked and possess little structural integrity. Most of the roof sheathing and shingle covering has deteriorated and needs replacing (Figure 23).

In general, the chicken house is in a state of ruin. The masonry walls of the structure are stable, but all of the wood framing has greatly deteriorated over time and is structurally unsound. The BLM undertook temporary stabilization measures to ensure that the chicken house would not collapse immediately; nonetheless, in its present condition, the structure will eventually fall down in time.

Causes of Deterioration--Sill deterioration is mainly from moisture retention in soil that has built up along the foundation. The saturated soil coming in contact with the wooden portions of the building's foundation have resulted in decay, particularly in the north sill. The lack of adequate roof covering has accentuated the deterioration process.

Root Cellar

Condition/Modifications--This building is in excellent condition due to a recent preservation effort by the BLM in coordination with SHPO during September of 1993. The work entailed replacing the deteriorated roof system in-kind, cleaning out the interior, rehabilitating and replacing the food storage shelving inside the building, and repairing cracks in the mortar on the exterior and interior of the building (Figure 25).

No work was done to the window on the north side. The wood framing is weathered and gaps between the framing and masonry have been filled with Portland

cement (Figure 26). This condition, however, does not effect the structural stability or integrity of the building.

Cracks in the mortar have been repaired with Portland-type cement, an incompatible material for this particular building, rather than a replication of the historic mud mortar (Figure 27). Using the correct type of mortar to repair masonry joints is critical. Softer mortars provide greater flexibility and accommodation to building movements. The harder mortars (those with a high percentage of Portland cement) can cause deterioration to the masonry and the building because the coefficient of expansion and the porosity of the masonry unit and the mortar are so different. Repointing mortar joints was not covered in the 1992 preliminary report as an immediate maintenance need and probably should not have been undertaken before recommendations could be outlined in an official historic structure report.

Causes of Deterioration--Deterioration of the root cellar in the past was due to lack of regular maintenance and upkeep, especially to the roof. Soil coming in contact with the top plate and rafters held moisture during the wet season, thus creating perfect conditions for decay. Rodent infestation also caused damage to the interior shelving. Cracks in the mortar joints indicate that some settlement of the building has taken place over the years.

Cistern

Condition/Modifications--The cistern is badly leaking along the north, east, and south sides, especially in the northwest, northeast, and southeast corners. The site around the cistern is very wet and is shaded all day long by young trees and bushes growing around it. The rubble stone facing has spalled completely off of the east side and is spalling off in places on the south side as well (Figures 29 and 30). The exposed concrete is saturated with water, and a thin film of moss and algae is growing on the wall. No cracks are apparent in the concrete on the exterior of the cistern. The out-take pipe was formerly cemented in place, but excess moisture has caused the pipe to loosen, and the cement plug holding it in place has become thoroughly saturated.

The wooden lid to the cistern is in good condition and is likely a more recent replacement of the original lid. The parged portion of the cistern is in fairly good condition, and although no cracks are evident, the parging on the west and south sides does not cover the entire surface area. The parging may have been applied fairly recently to repair cracks. There is some lichen growth on the surface of the parging.

The BLM has recently repaired some cracks in the concrete that developed on the interior walls of the cistern. The cracks were filled with tar and concrete sealer. No other repair work or modifications have been done to the cistern to date.

Causes of Deterioration--Past and present saturation of the concrete walls of the cistern is the cause of deterioration of this structure. Because concrete is so porous in nature, the interior of any water-retaining feature constructed of concrete must be completely sealed with some type of waterproof coating. This coating must be checked regularly for cracks so that moisture does not seep into the concrete walls. In the past, insufficient upkeep of the waterproof coating on the inside walls of the cistern resulted in the ultimate saturation of the concrete and, through the actions of thermal expansion, caused the rubble stone facing to spall off of the walls. Presently, overflow from the out-take pipes and hoses where they exit the cistern has created a constant flow of water over the exterior sides of the structure. The shadiness of the site also creates a slower rate of evaporation so that the cistern is never directly exposed to the sun, and the exterior surfaces of the structure cannot dry out. The trees and bushes that shade the cistern have grown up around the structure since the historic period.

Generator Shed

Condition/Modifications--The generator shed is in fair to good condition. The walls and roof are in good repair, although the foundation sill on the west side is partially rotten. Some of the exterior decking planks are also in a deteriorated condition. The floor on the inside of the structure is a little spongy, and when viewed from the front (east side), the entire floor system is sinking on the north side. The only recent modification to the shed is the addition of a small solar cell panel on the south exterior wall.

Causes of Deterioration--Soil coming in contact with the sill is the reason for its decay. During the wetter months, soil holds moisture against the wood, thus causing rot. The floor decking outside of the building is directly exposed to the weather (sun, wind, precipitation), consequently causing portions of the deck to deteriorate.

Outhouse (Privy)

Condition/Modifications--This building is generally in good condition, though one wall board is missing from the north side. The rolled asphalt roof covering needs replacing, however, and the interior is dirty. The only modification is the plywood front on the bench seat.

Causes of Deterioration--Since the outhouse has been kept painted, it has been protected from the deteriorating effects of weather. The roof appears to have always been maintained (until recently), and no signs of water leakage were noticed during the examination of the building. The rolled asphalt roofing, however, has exceeded its life expectancy. No rot was noted along the base of the outhouse.

Morrison Ranch (Lower Tract)

Root Cellar/Bunkhouse

Condition/Modifications--This building is in very good condition with the exception of some minor settlement and/or thermal or moisture movement at the west end of the structure, as indicated by some vertical cracking noted on the interior west wall. No identifiable structural instability was seen during the inspection of the building, and no rot, water damage, or insect damage in the wooden members was noted. All walls appear to be solid and plumb, and the roof system retains excellent structural integrity.

Portions of each exterior wall have been repointed through time since the building was first constructed. On both the north and south walls, repointing was done probably within the last 40 or so years with a hard Portland-type cement mixed with sand and very small aggregate from the northwest and southwest corners east along the walls for about eight feet (Figure 35). The remainder of the masonry along this wall retains its original historic mud mortar. Along the portion of the north wall that is rubble rather than dressed stone, rodents have dug holes into the building through the mortar joints. The mortar joints of the rubble portion of the wall have deteriorated. This condition is true along the east wall as well, and rodents and weathering have disturbed and deteriorated the masonry joints. The southeast corner was patched at some point with Portland-type cement, and care was not taken to match the original masonry handiwork (Figure 36). The west wall mortar joints have all been repointed with a harder mortar than what was historically used.

Causes of Deterioration--Mortar deterioration of the masonry units has been caused mainly by weathering, erosion, and disturbance by rodents. The cracks found on the interior west wall could be caused by thermal or moisture movement in the wall and the soil or by differential settlement of the building.

Garage/Shop

Condition/Modifications--The building is in good structural condition, and both the roof and foundation (with the exception of the northwest corner, as explained below) are functioning adequately. The exterior siding, however, is quite deteriorated, especially on the south side. The lower siding boards on this side from girt level to the ground are severely cupped and moisture damaged. Lichen growth is abundant, and the bottom ends of the boards where they are attached to the sill have rotted (Figure 39). The top half of the siding from girt level to the eave is not in as bad a condition; still some boards are warped from weathering.

A 1x8 piece of blocking underneath the sill from the southwest corner along the south side is in poor condition due to rot from moisture, but the sill itself appears solid. Nonetheless, dirt has packed up at the bottom of the 1x8 and the siding boards, creating an avenue for moisture to be transferred from the ground to wooden structural members.

Some siding boards on the west wall are cupped, bowed, and warped. The footings are solid except for the northwest corner where a wooden block has been used to level this corner, but the footing needs to be reset. The window on the wall is very deteriorated. One muntin is missing, one window pane is broken, and two panes are completely missing. The window does not properly fit the opening in the wall.

Some of the siding on the east side of the building is deteriorated at the bottom, and some boards are cupped, but sound. The sliding door is in good operating condition. The panes in the window need putty, one pane is cracked, and the window sill has come unnailed. The mummified steer head above this window has greatly deteriorated since 1992.

The shed addition is in poor condition and is not entirely structurally sound, though it is not in any immediate danger of collapse. It has helped preserve the north side of the garage/shop by sheltering it from the weather. The roof shingles on the addition are all very decayed and covered with lichen growth; many are missing. Some of the glass in both windows is missing.

In general, the garage/shop exists today as it was originally built, with no noticeable modifications except the shed addition to the north.

Causes of Deterioration--The south and west sides of the building are exposed to the worst weather conditions, since the majority of the winter storms come from that direction. Wind, sun, and precipitation have all taken their toll on the exterior building materials of the garage/shop. In addition, a nearby ground sprinkler for the former pasture to the west hits the south side of the building, exacerbating the moisture problem on this side.

Stone Dugout/Root Cellar Ruin

Condition/Modifications--This structure is in a state of ruin. There is good preservation of the north and east masonry walls, though the mortar in these walls has deteriorated (Figure 42). Some of the rubble stone from the walls has fallen into the interior of the structure, and there is a pile of rubble stone along the exterior north wall just outside the door. Two historic artifacts, an aqua colored bottle base and a tin can lid, were found among this rubble stone. The door itself is twisted and weathered,

but could be salvaged. George Wright, who owned the property during the 1950s, told the BLM ranch caretakers that the cellar once had a board roof covered with dirt, and that the roof collapsed under the weight of a milk cow that had wandered on top of the building while grazing (Krause and Krause 1995). Some wood shingles were found stuck in cracks of the rock face wall just above the eight-inch pipe. It is not known if these were used in the construction of the roof as well.

Causes of Deterioration--The principal cause of deterioration of the dugout/root cellar is a lack of regular maintenance in the past and weathering. When the roof collapsed, it was not repaired, and the entire structure was left to decay.

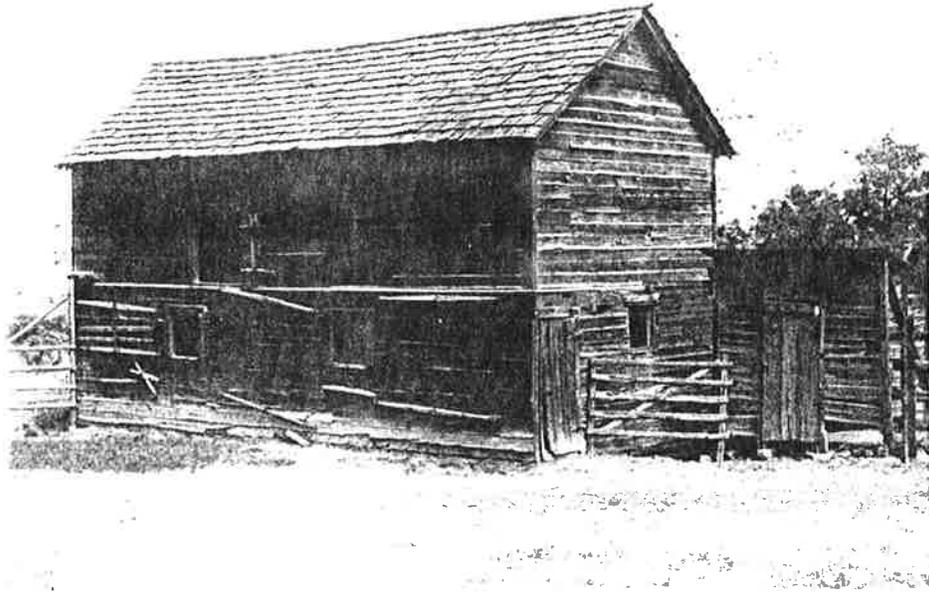


Figure 7. Birch Creek barn, west and south (gable) elevations, facing into corral. Tack room building is to the right. (Neg. R2-32)

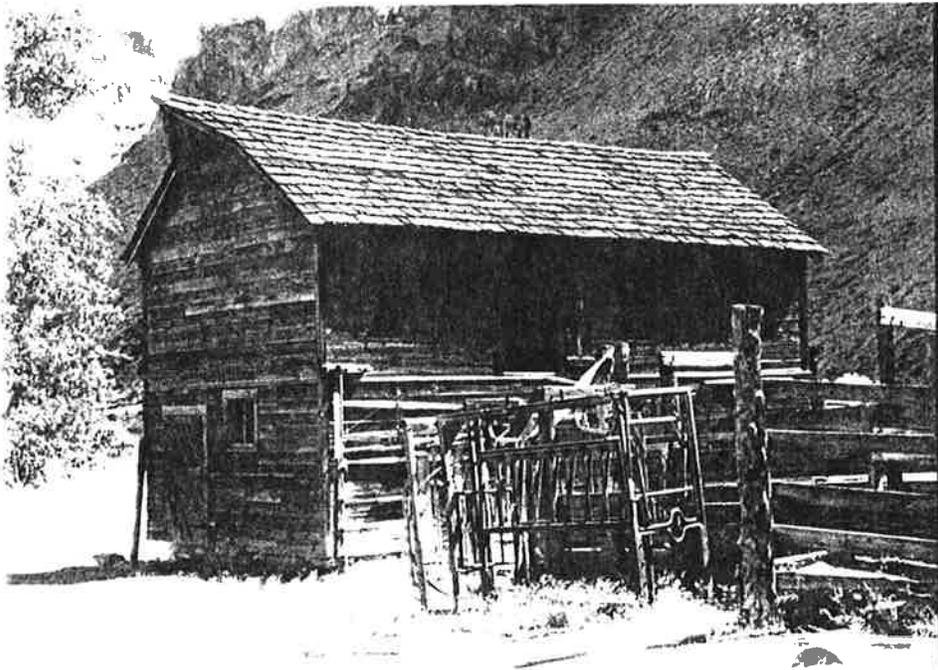


Figure 8. Birch Creek barn, north (gable) and west elevations. Squeeze chute and loading ramp are in the foreground. (Neg. R2-34)



Figure 9. Birch Creek barn, east elevation facing the Owyhee River. (Neg. R2-21)

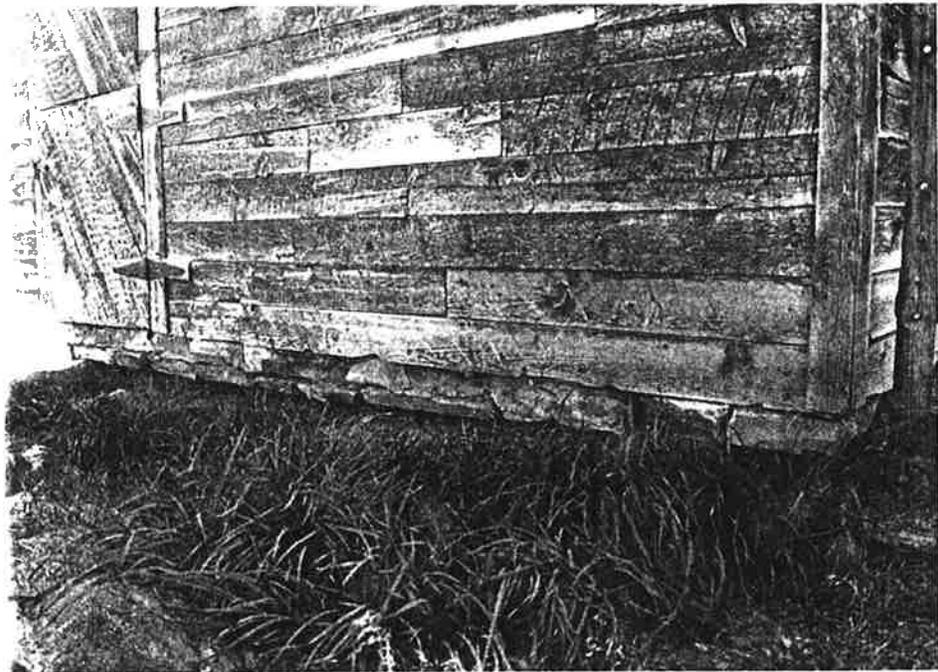


Figure 11. Birch Creek barn, north side, depicting undercutting below foundation caused by the March 1993 flood. (Neg. R2-27)

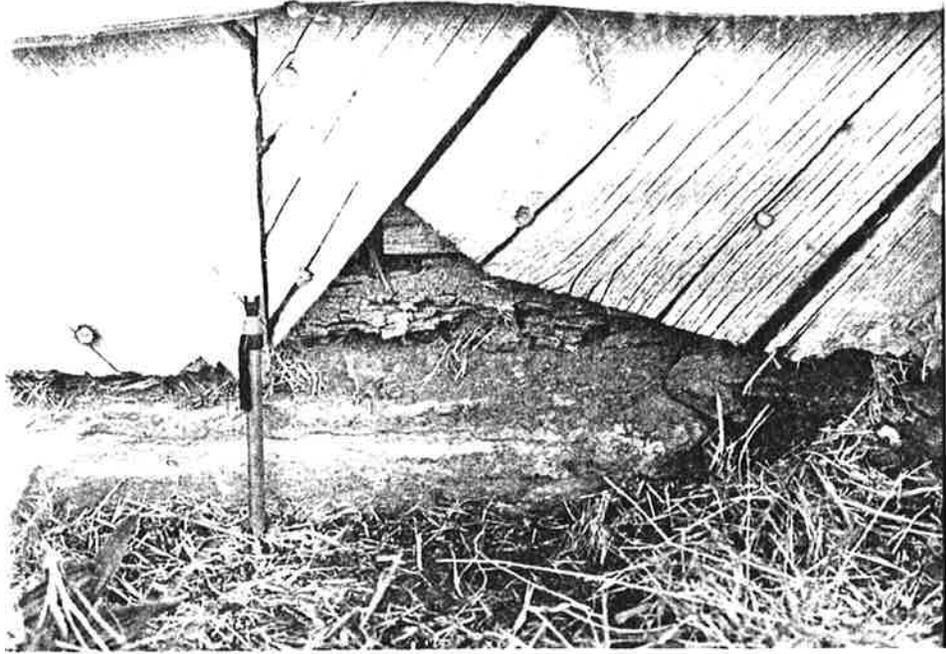


Figure 12. Birch Creek barn, west side sill decay. (Neg. R2-31)

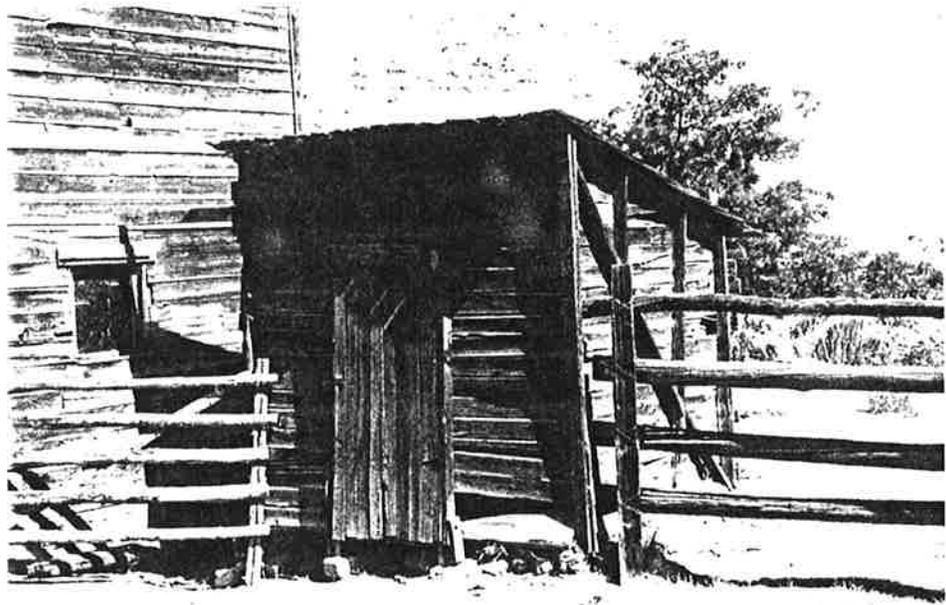


Figure 13. Birch Creek tack room building, west (with door) and south elevations, facing into corral. Barn is to the left. (Neg. R1-35)

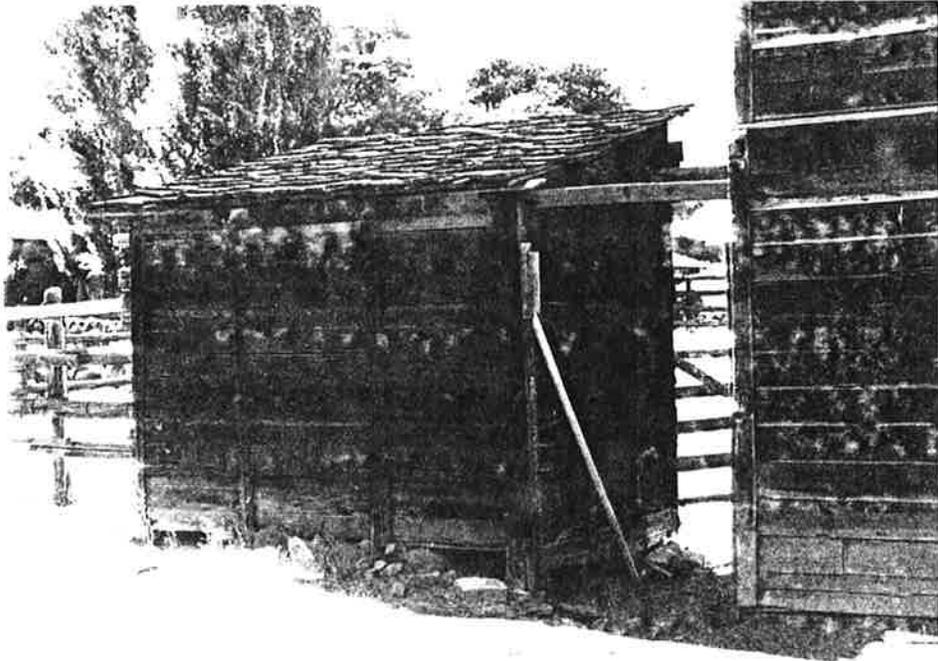


Figure 14. Birch Creek tack room building, east and north elevations. Note the 2x4s attached between the building and the barn to the right added as a temporary stabilization measure. The March 1993 flood deposited debris underneath this building. (Neg. R2-1)

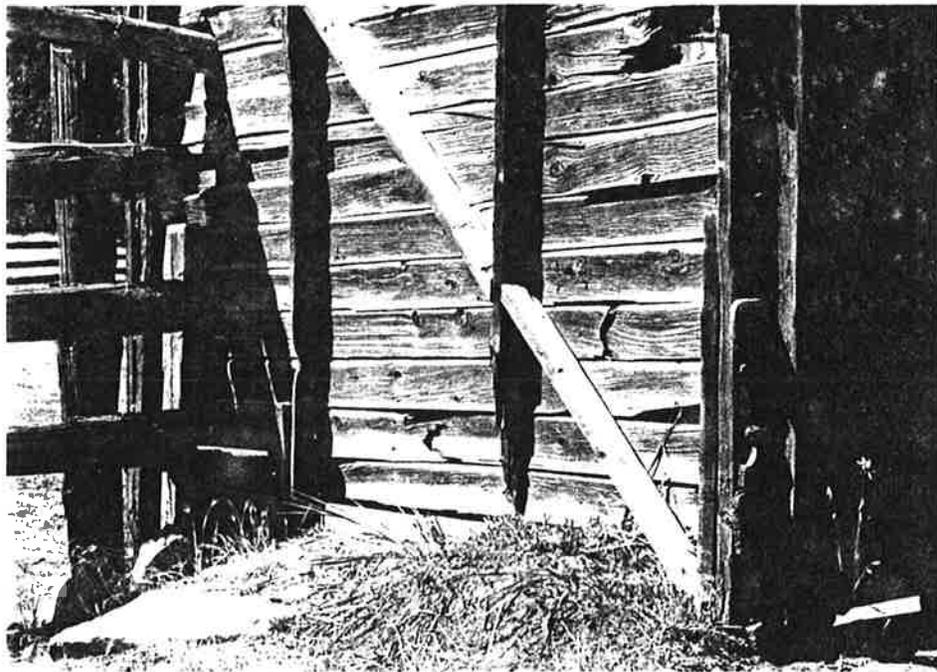


Figure 15. Birch Creek tack room building, south side. Soil has accumulated at the base of the building and acts as a sponge during wetter months by holding in moisture in direct contact with the wood framing. Note the deterioration of the studs. (Neg. R2-4)



Figure 16. Birch Creek bunkhouse/shop, east (front) and north elevations. (Neg. R3-1)

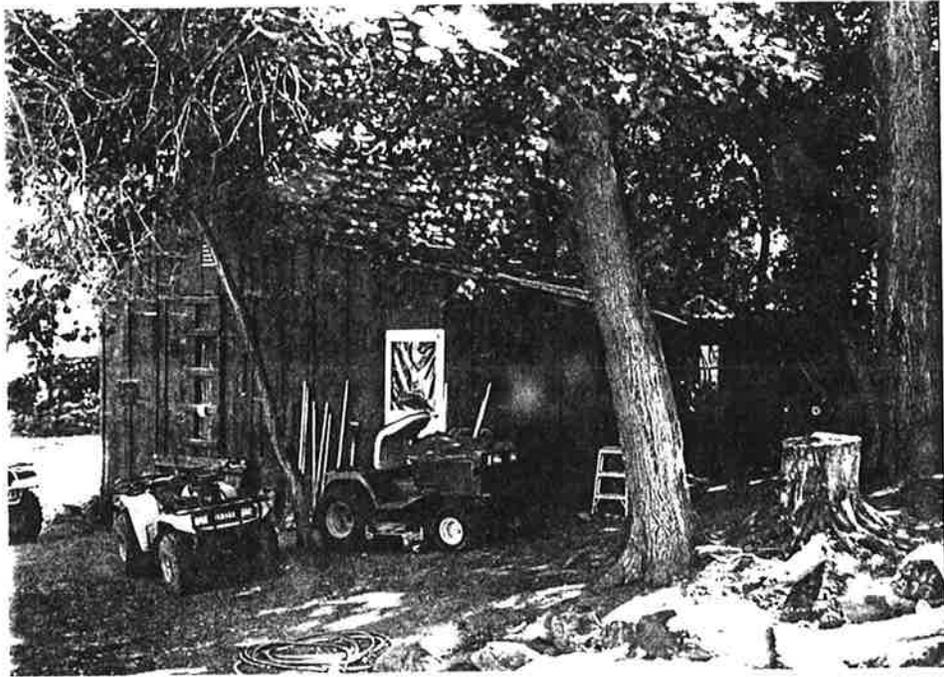


Figure 17. Birch Creek bunkhouse/shop, north and west (rear) elevations. Shed-roofed section is the shop. (Neg. R3-5)

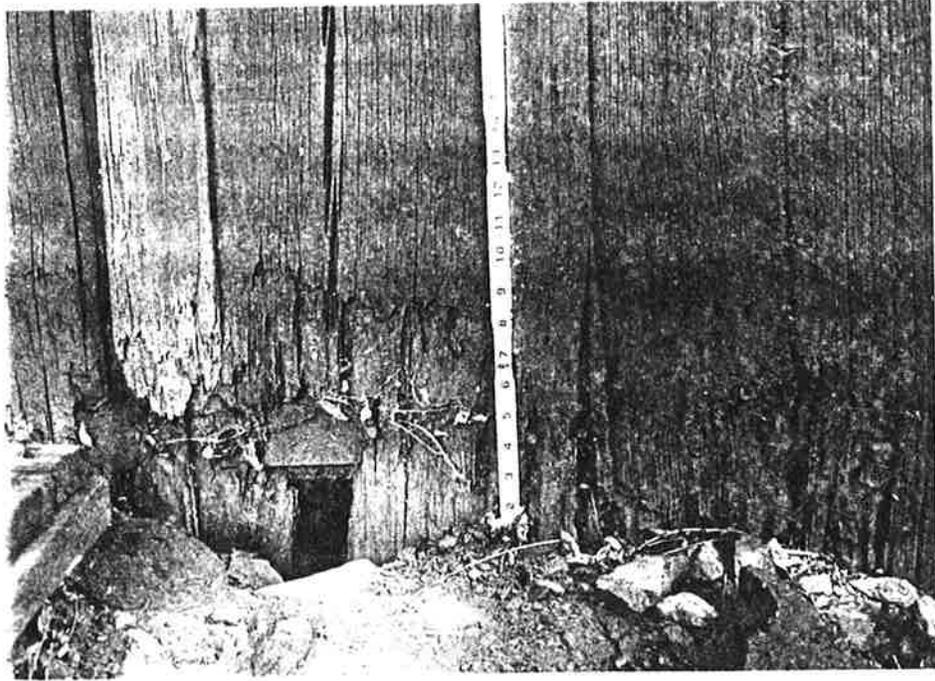


Figure 18. Birch Creek bunkhouse/shop, south side. Soil in direct contact with wood causes damage to the siding and sill by retaining moisture during wet months. (Neg. R3-8)

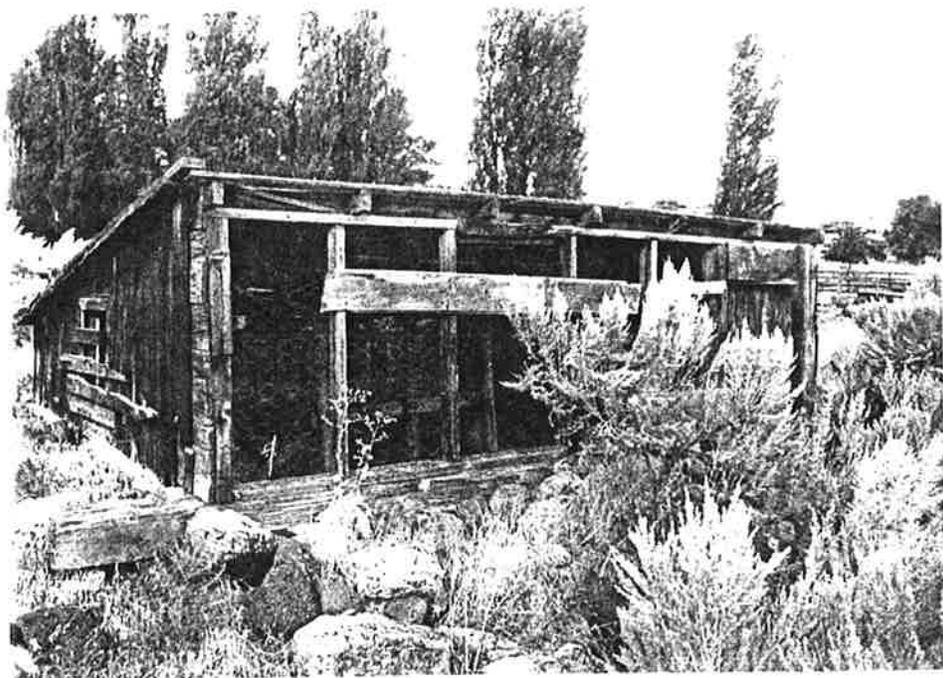


Figure 19. Birch Creek chicken house, south (side) and east (front) elevations. (Neg. R2-13)

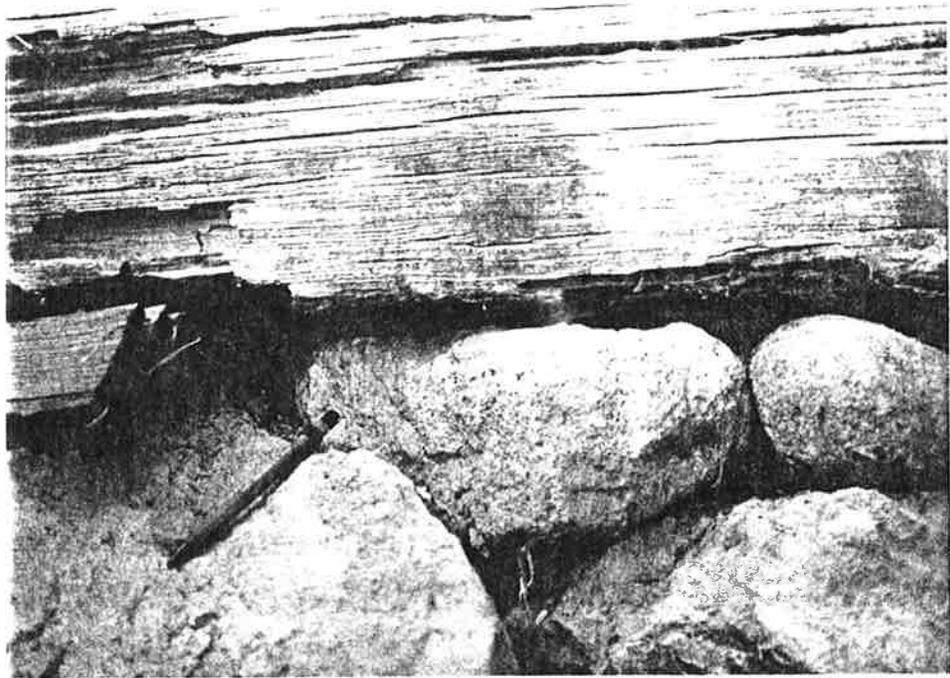


Figure 21. Birch Creek chicken house, interior view of typical sill deterioration along south wall near southeast corner. (Neg. R2-19)

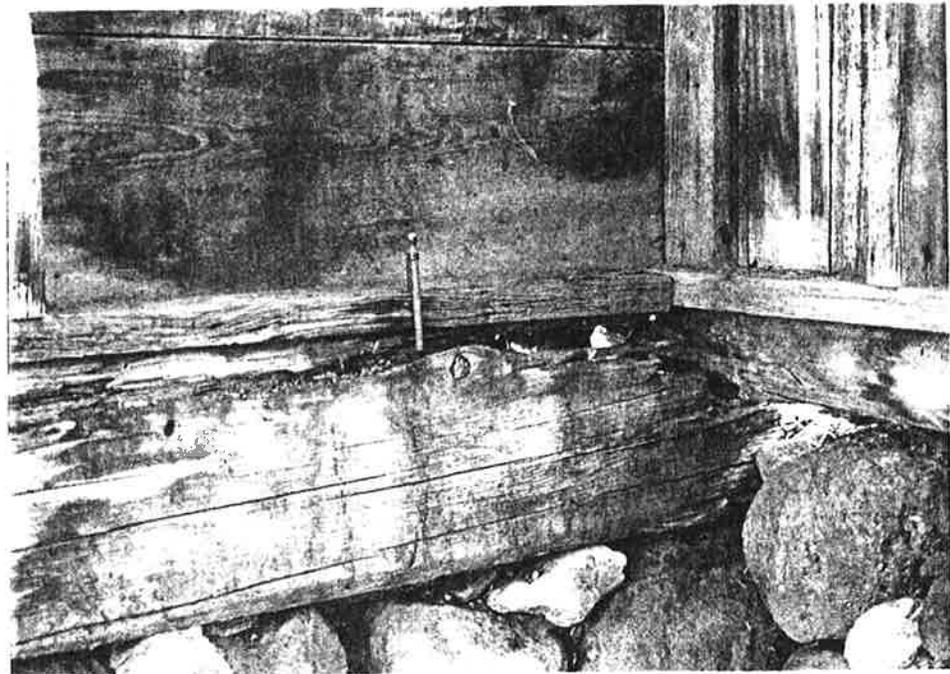


Figure 22. Birch Creek chicken house, interior view of south sill deterioration at southwest corner. (Neg. R2-20)

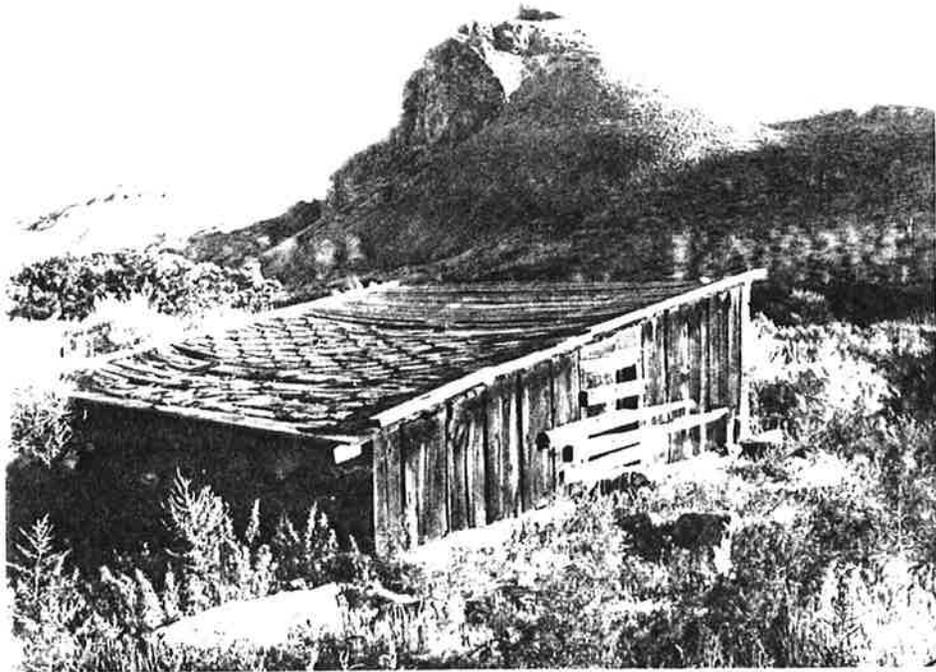


Figure 23. Birch Creek chicken house, west (rear) and south (side) elevations showing roof failure. (Neg. R2-18)



Figure 24. Birch Creek root cellar, south and east (front) elevations with old chicken house ruins off the south side (far left). Irrigation ditch flows in front of cellar. (Neg. R3-10)

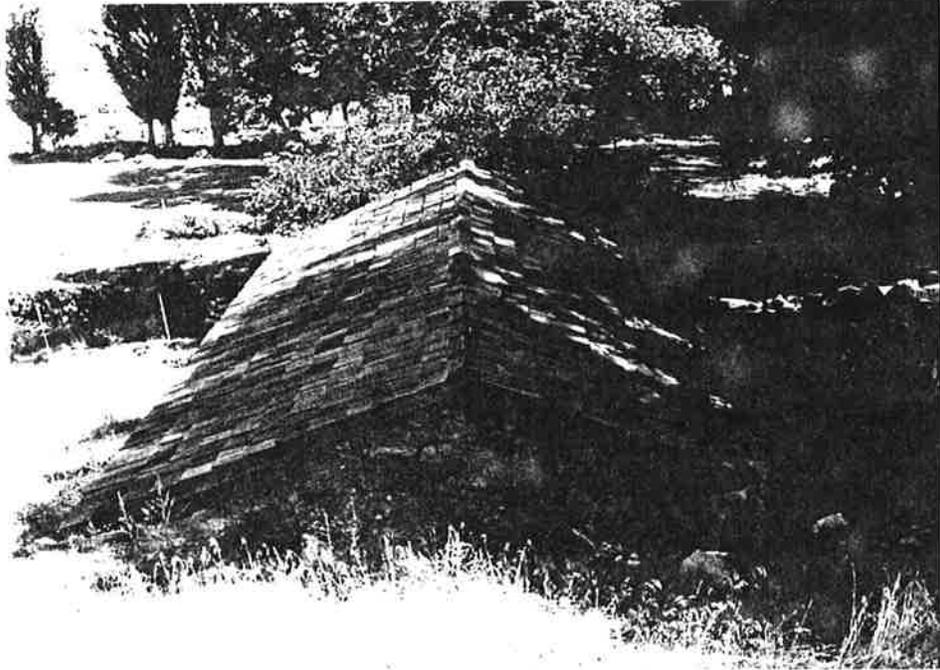


Figure 25. Birch Creek root cellar, showing west elevation from hillside. Roof was rebuilt by BLM in September 1993. (Neg. R3-13)

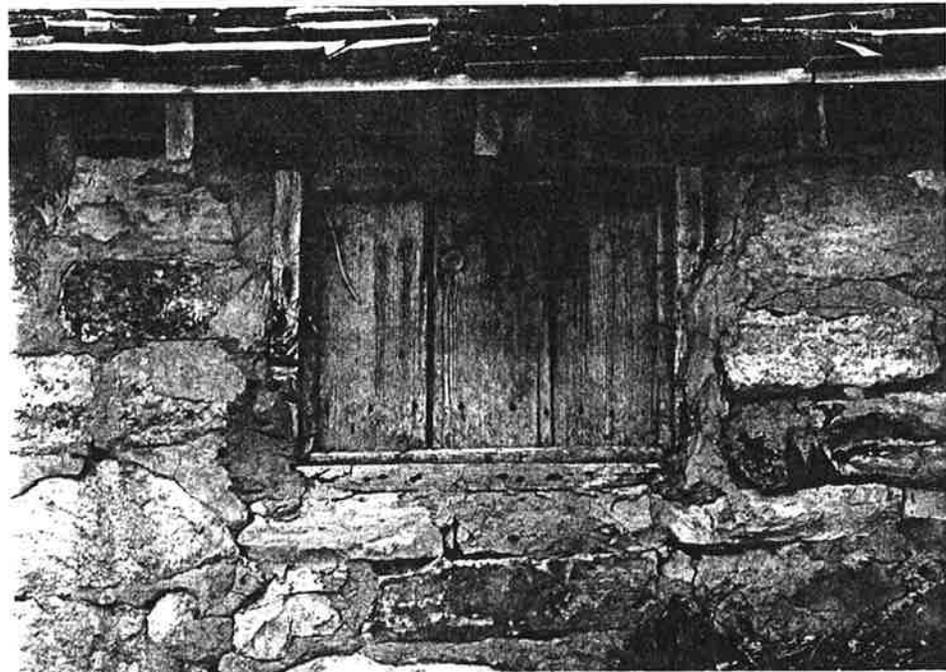


Figure 26. Birch Creek root cellar, showing weathered north window framing. Voids between the framing and masonry have been filled and patched with Portland cement. (Neg. R3-16)



Figure 27. Birch Creek root cellar. Repointing was done with inappropriate mortar (Portland cement) and was not applied with care. (Neg. R3-15)



Figure 29. Birch Creek cistern, east and north elevations showing spalling of rock facing, dampness, and vegetation growing around structure. (Neg. R3-20)



Figure 30. Birch Creek cistern. Detail of saturated east side where rock facing has spalled off from concrete. (Neg. R3-22)

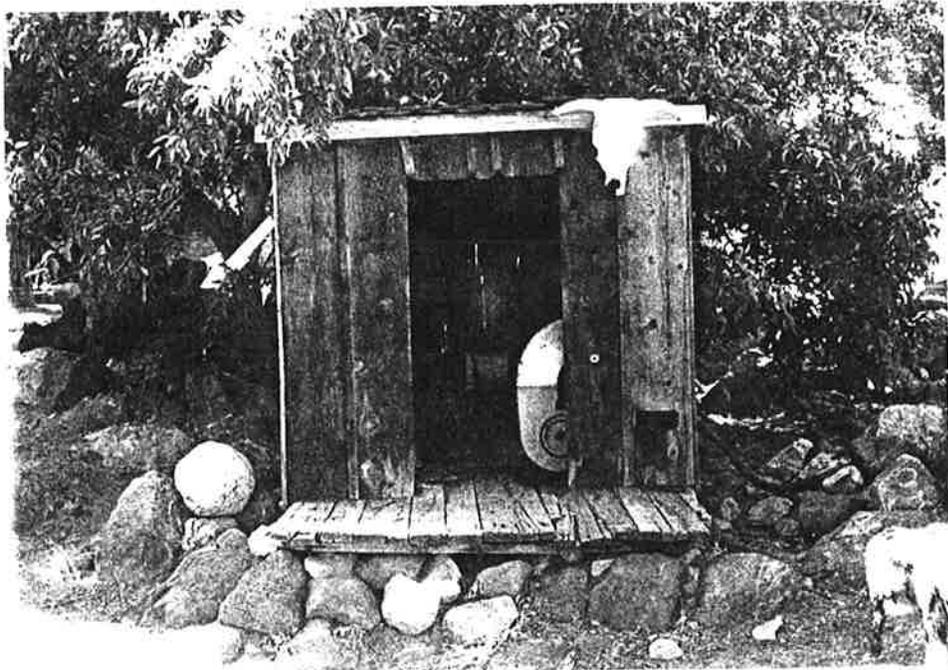


Figure 31. Birch Creek generator shed, east elevation. (Neg. R2-7)

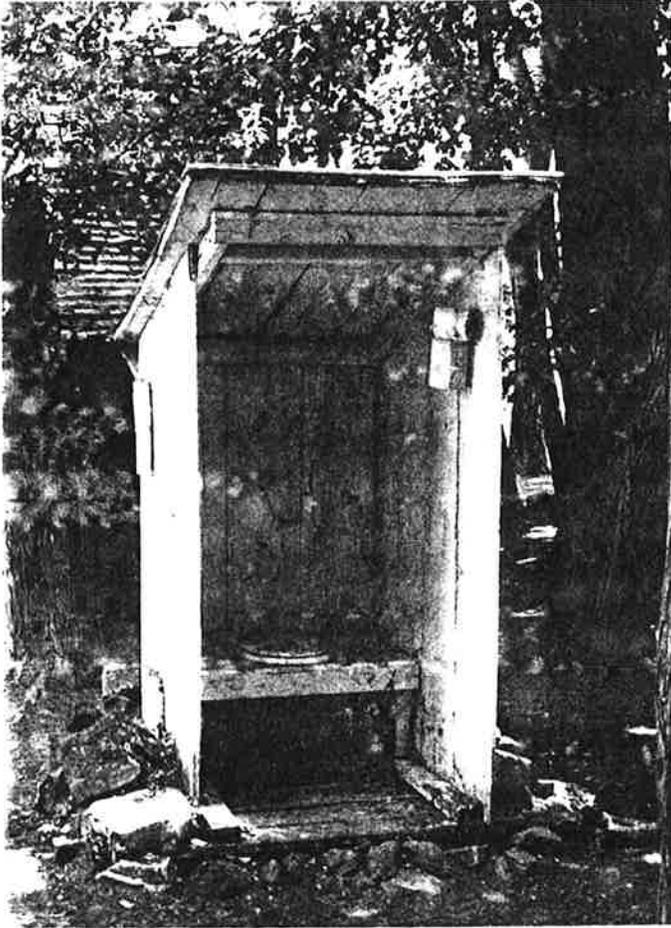


Figure 32. Birch Creek outhouse, west elevation. (Neg. R3-17)



Figure 33. Morrison root cellar/bunkhouse, north (with door) and west (gable) elevations. Roof system, door, and propane lamp were all added after 1968 by Martin Rust. (Neg. R1-0)

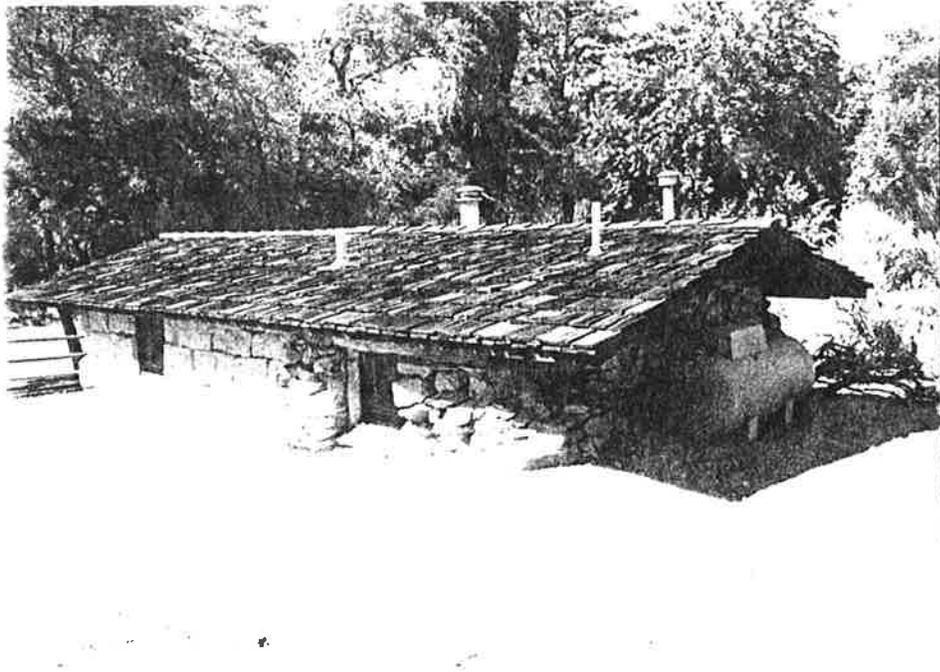


Figure 34. Morrison root cellar/bunkhouse, south (with windows) and east (gable) elevations. (Neg. R1-1)

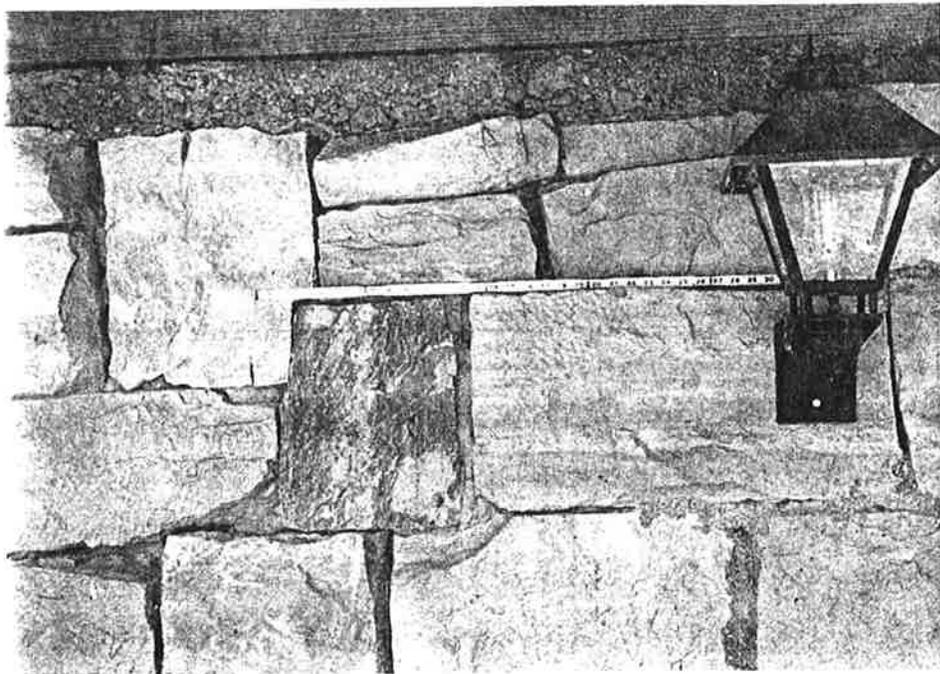


Figure 35. Morrison root cellar/bunkhouse, north side, showing older repointing of mortar joints (lower right corner) and original mud mortar still in place. (Neg. R1-5)

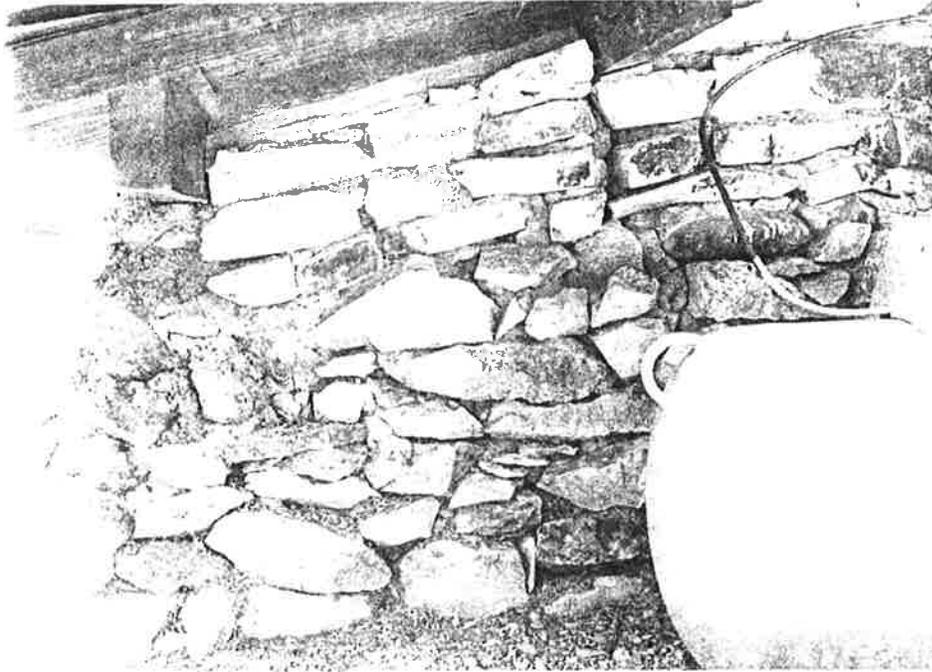


Figure 36. Morrison root cellar/bunkhouse, east side, southeast corner. Corner repaired with Portland cement without attention to original craftsmanship. (Neg. R1-6)

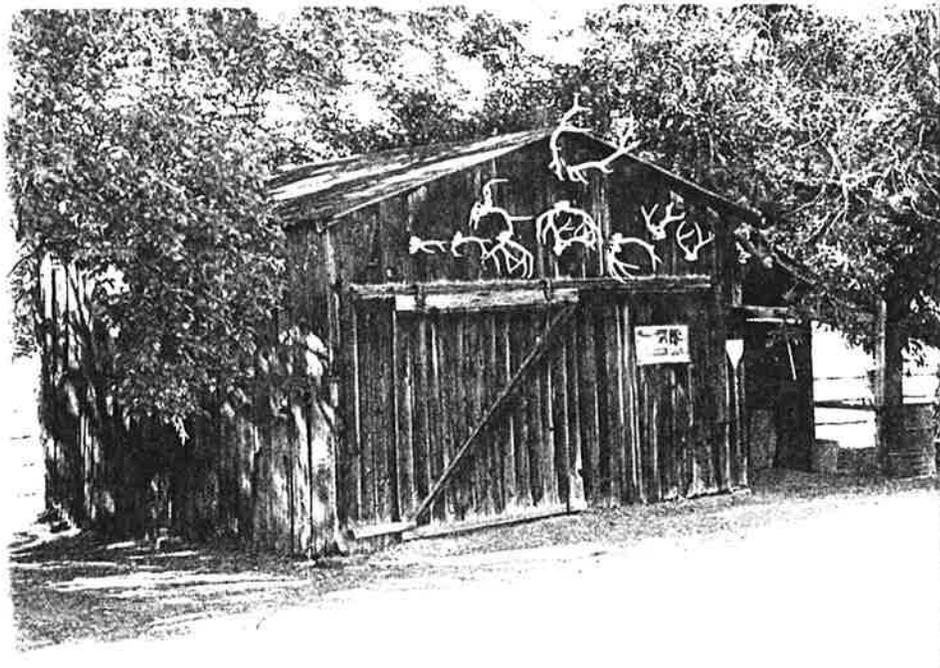


Figure 37. Morrison garage/shop, south (side) and east (front) elevations. Mummified steer head is in northeast corner just below eave. Shed addition is to the right. (Neg. R1-11)

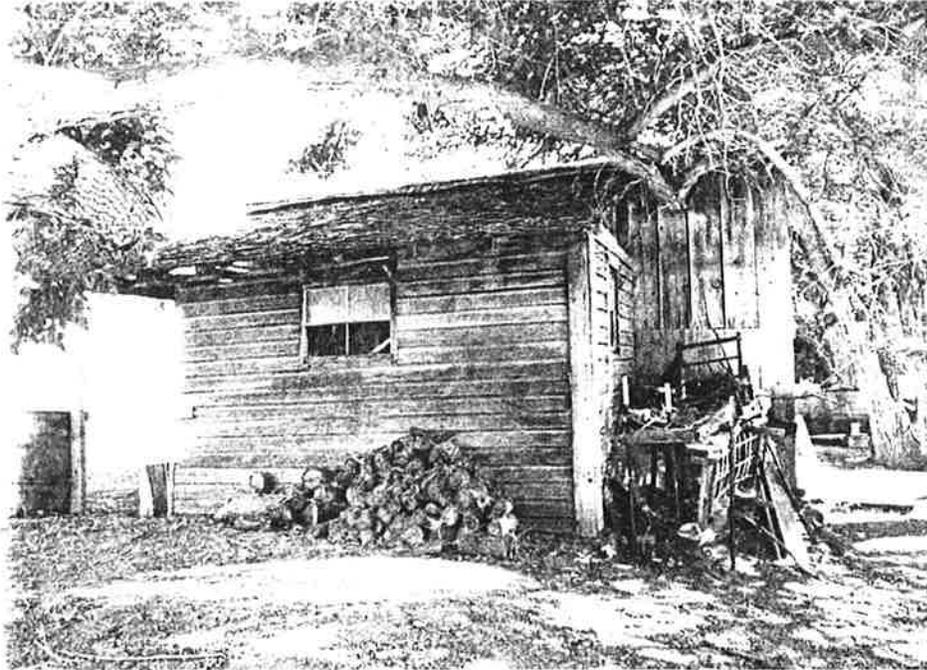


Figure 38. Morrison garage/shop, north side of shed addition with firewood and patio furniture piled against the walls of the building. (Neg. R1-16)

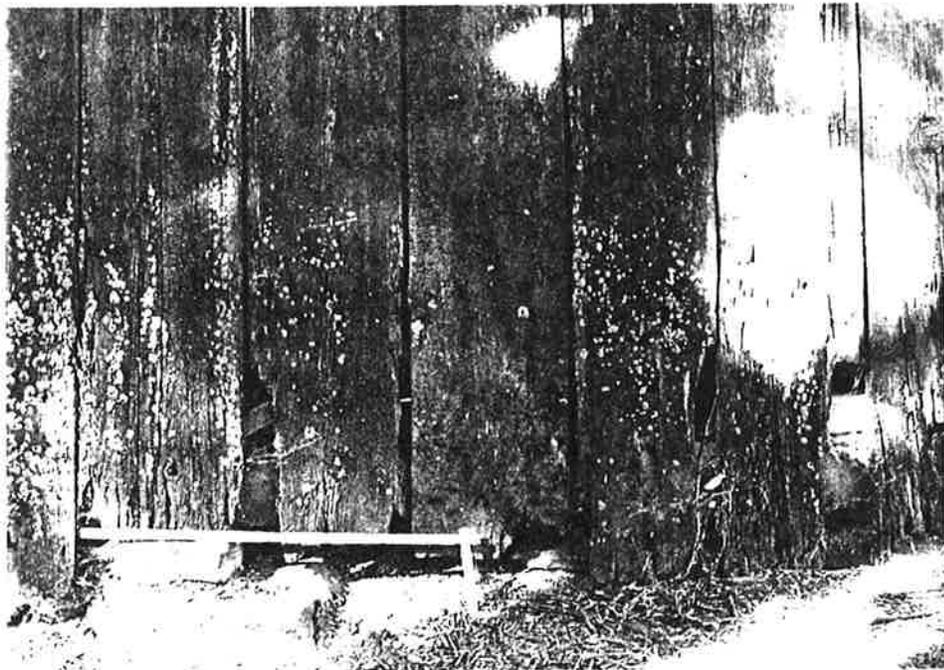


Figure 39. Morrison garage/shop, south wall moisture damage. (Neg. R1-15)



Figure 40. Morrison stone dugout/root cellar ruin. View is to the northwest. (Neg. R1-26)



Figure 41. Morrison stone dugout/root cellar ruin. Interior view of northeast corner. (Neg. R1-22)

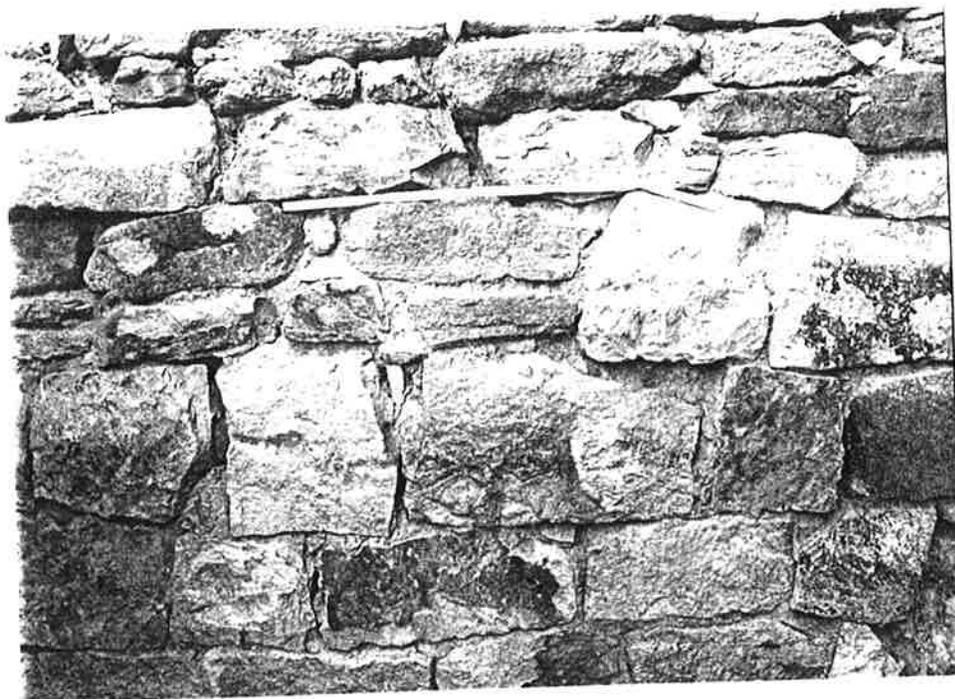


Figure 42. Morrison stone dugout/root cellar ruin, east wall interior. View depicts masonry wall in a generally good state of preservation. (Neg. R1-23)

3. TREATMENT AND USE

The BLM is in the process of finalizing a management plan for the Birch Creek Ranch Historic Rural Landscape, but as of this writing there is no formal draft. Management plan objectives regarding socio-cultural resources at the ranch have been identified, however. Two objectives have been singled out for cultural resource management:

1. to maintain the buildings and the historic landscape in a manner consistent with the National Register status of the property, the National Historic Preservation Act, the history of the ranch, and the best interests of the public; and
2. to interpret the history of the ranch and the prehistory of the immediate area for the public insofar as it is consistent with protecting archaeological resources.

The actions associated with each objective include producing a Historic Structure Report in concurrence with SHPO, to guide the agency in the maintenance and preservation of those architectural resources that contribute to the historic significance of the ranch, and to follow the prescribed maintenance and preservation plan so that the integrity of those resources is retained. Regarding interpretation, the BLM's planned action is to develop interpretive materials (signs, brochures, self-guided tours, etc.) in coordination with the BLM's Recreation Program. This action will likely be more defined once the Historic Structure Report is incorporated into the management plan.

The BLM is still deciding which activities and land uses are appropriate to maintaining a sense of history at Birch Creek Ranch and should be allowed within the boundaries of the historic district. Included in these activities are grazing, the overwintering of livestock (specifically mules and wild horses), and mineral exploration. Other management concerns address how the natural vegetation, ornamental cultigens, and agricultural plots should be managed and how to incorporate recreation considerations without compromising the integrity of the historic resources. The BLM is presently weighing the pros and cons of making the Morrison Ranch headquarters available for public rental (in particular, the sleeping facilities) and leasing all or part of the entire property to a concessionaire. Additional recreation development considerations include providing potable water to the public, developing recreation trails, and establishing and maintaining overnight camping facilities and float-boater

put-in/take-out points. If this type of recreation development is favored, the BLM must grapple with the issue of accessibility of the property by road and whether to improve that accessibility to encourage visitation.

Each of these management options could potentially effect historic resources (including improving the road, which has largely remained unchanged for several decades) in the Birch Creek Ranch Historic Rural Landscape. The BLM should keep in mind that before the final management plan is drafted and put into effect, consultation with SHPO is highly recommended for input regarding the effects that future development and activities might have on the entire property as a *rural historic landscape*, in addition to possible effects on contributing buildings and structures. It is important that the BLM carefully consider all future uses of the property and their effect on the Birch Creek Ranch Historic Rural Landscape as a rural historic landscape. Historic landscapes not only comprise vegetative, archaeological, and architectural features, but also contain geographical and visual features, such as the surrounding natural environment and viewsheds, which help define the character of the overall landscape. Certain uses of the property, such as mining, quarrying, and incompatible development of the property to accommodate large numbers of people (utility improvements, intensive recreational development) would detract from the primitiveness, quietude, and historic ambiance of the Birch Creek Ranch Historic Rural Landscape.

ULTIMATE TREATMENT AND USE

Birch Creek Ranch Historic Rural Landscape maintains a high level of historical authenticity and integrity, characteristics that are reflected in the ranch's buildings and structures. Because of these characteristics, it is recommended that the BLM concentrate their care of the property in the *preservation* of the resources and landscape as the primary treatment rather than rehabilitation, restoration, or reconstruction (see Appendix A). The act of *preservation* is the process of applying the necessary measures for sustaining a historic building's existing form, integrity, and materials: "preservation entails the essential operations to safeguard existing resources" (Birnbaum 1994:15). Preservation emphasizes protection, stabilization, cyclical maintenance, and repair of character-defining features rather than replacement or reconstruction of those features.

The property is significant because of its rustic nature, and thus maintaining the buildings in a condition that conveys this rustic nature should be the primary goal of the BLM. Preservation activities at the Birch Creek Ranch Historic Rural Landscape should focus on (1) alleviating the conditions which cause historic materials to decay in the first place, (2) stabilization and repair of structural systems, and (3) general building maintenance to ensure that problems do not reoccur. For example, if the

siding on a building is damaged due to a reoccurring moisture problem, "repair" the situation by remedying the source of the moisture problem (improve site drainage) but leave the historic fabric intact as long as it is still functioning as a covering for the structural frame. Replacement is warranted only if the building element can no longer perform its basic function.

One must keep in mind the historic tradition of rural building in this region. If a building became unsound or was no longer needed, historically the farmer/rancher was inclined to either let the building continue to deteriorate until it collapsed or disassemble it and reuse the sound building materials in other construction projects on the ranch. Evidence of this behavior can be found at both the Upper Tract (chicken house) and Lower Tract (garage/shop) in the use of recycled building materials found in certain outbuildings. If replacement of historic fabric is necessary due to structural concerns, it would be most appropriate (and in keeping with historical tradition) to use recycled lumber in the repair of buildings at Birch Creek.

The following addresses the preservation treatment of the contributing buildings and structures, suggests remedies for materials deterioration and problems of structural inadequacy, and suggests how to guard against future causes of deterioration. Basic strategies toward maintaining the historic integrity of the architectural resources of the Birch Creek Ranch Historic Rural Landscape are also outlined below.

Birch Creek Ranch (Upper Tract)

Barn

Recommendations of Treatment and Use--Flood damage to the foundation system of the barn should be addressed, especially on the north side of the building. It may be necessary to jack up the building and replace portions of the sill on the south, east, and west sides. Soil that was washed away from the north side, particularly the northeast corner, should be replaced and the grade raised to the appropriate level. Cobbles and gravel, as well as compacted earth fill, should be used. When the foundation is being repaired, the BLM can grade underneath the barn to clear away flood debris and level the building site and repair and/or replace any first floor joists that have deteriorated (these were not accessible during the inspection of the building). Resetting the barn squarely on its foundation and on a repaired sill should correct the problem of the south wall buckling and the interior posts not adequately carrying the second floor load. The posts should be nailed securely to the floor joists above.

The entire outside perimeter of the barn needs to be graded and the dirt and grass growth that has accumulated up against the wall cleared from the foundation and

sill. If graded at a slight angle away from the building, this action can also help channel water away from the building so that it does not seep into the foundation system. A layer of gravel around the perimeter of the barn at the dripline can also aid in draining the building site. The lower two to three exterior siding boards on the east wall are deteriorated, as well. These should be replaced with a compatible material, preferably used pine lumber, so they can once again help protect the sill from the effects of weathering.

Soil and dirt have also accumulated on the inside of the barn's west wall under the feed trough. This should be cleaned away to prevent moisture retention of the sill and wall framing. Rodent droppings are abundant everywhere on the inside of the barn. These need to be cleaned out periodically.

At present, the barn is being used for storage of saddles, tack, grain, and maintenance equipment and materials. Some hay is being stored in the loft. The BLM plans to continue to use the building as a barn and for storage.

Tack Room

Recommendations of Treatment and Use--Since the tack room is in such derelict condition structurally, it is not feasible to try to save all of the original building materials. As noted above, the building was likely constructed from recycled materials originally and was not constructed in the most structurally sound manner. There is a question as to the date of the building and its association with the Basque heritage of the ranch--it could very well be a much later addition to the building group. However, since the tack room is a contributing element to the significance of the property, the BLM has an obligation, at a minimum, to stabilize the building and attempt to discourage further deterioration. The tack room can be braced by adding more structurally sound 2x4s to the corners and additional 2x4 diagonal bracing to the exterior, thus securing the structure against total collapse. In keeping with the construction tradition of the building, it would be historically correct and appropriate to utilize used lumber in the stabilization effort and in the replacement of failed wall studs on the south side.

Packed dirt and accumulated debris deposited during the 1993 flood should be cleared from under the tack room and away from the sill and foundation, so that ventilated space can be maintained under the building. Additional rubble stone footings could be laid to strengthen the foundation. If the door hinges can be salvaged, it is best to reuse these rather than replace them. The vertical boards to which they are attached may need to be replaced if they are too decayed to hold nails. Just these boards, not the entire door, should be repaired. The interior of the building should

be cleaned of rodent droppings periodically. This building will be used as a storage facility by the BLM.

Bunkhouse/Shop

Recommendations of Treatment and Use--Soil abutting the building should be cleaned away so that the foundation is exposed and the siding is not in direct contact with the ground. Grading two to three feet away from the building will halt deterioration to the sill and siding from the build-up of soil. The BLM may consider placing a layer of gravel two feet out from the foundation on the south and north sides of the building to facilitate site drainage. The graveled areas that currently exist should be cleaned free of organic debris that could be trapping additional moisture next to wooden structural members.

The windows should all be recaulked with traditional glazing putty, rather than historically incompatible silicon sealant. Since this building is presently painted (and always appears to have been), the sash should be kept painted for protection against the weather. Both exterior doors should also be kept painted for the same reason. The window glass should be replaced in the shop door and the door hardware tightened.

The roof on the shop addition needs attention. With the additional load of wood shakes on the structurally inadequate 2x4 rafters, the roof will continue to sag and eventually become unsafe. The existing rafters could be braced with vertical supports or by nailing additional 2x4s onto the sagging ones to improve their load-carrying capability. Upgrading the rafters to 2x6s may be justified, considering the inadequacy of the present 2x4s, but concurrence from SHPO is recommended. The building was reroofed not long ago, and the shakes are in good condition.

The shop section of the building will continue to be used in that capacity by the BLM ranch caretakers. In the future, the bunkhouse section may be used as sleeping quarters for visiting BLM personnel.

Chicken House

Recommendations of Treatment and Use--The basic structural system of the chicken house needs to be upgraded, though the wall sheathing and exterior siding can be saved. Large portions of the sill are decayed; still some of the deterioration appears to be old and not a result of a present problem. The sill is solid on the east, west, and south sides even with the noticeable deterioration. The north side sill has poor structural integrity and should be replaced in kind. The bottom plates, studs, and top plates should be either braced or replaced with more structurally sound materials. Since the structural condition of the rafters is questionable, the BLM may consider

replacing these with used 2x4s. Some of the roof sheathing can be salvaged, but additional sheathing should be used to replace that which is unsound. The roof should be covered with new composition shingles. In keeping with the historic tradition of using recycled building materials, used lumber, rather than new, is recommended for any repair work done to this structure in the future.

The door is salvageable, but the windows could be repaired. All hinges can be reused. The perimeter of the building needs to be cleared of dirt and organic debris, including the removal of obtrusive vegetative material such as sagebrush and grasses. The areas where the sill meets the foundation stones should especially be kept clear of soil build up.

At present, the BLM has no plans for the use of this building. Since there are no known historic photographs of this structure available, it is not recommended that the chicken yard be reconstructed, because the configuration, construction materials, and size are not known at this time. If the chicken house is to be used again as a chicken house, the yard could be recreated, but accompanying interpretation should make it clear that the historic configuration of the yard is not known.

Root Cellar

Recommendations of Treatment and Use--On the west side of the building the eave is only six inches above grade. Since the root cellar is constructed into the hillside with the slope continuing uphill to the west, soil will inevitably begin to build up along this west wall. It is crucial that soil does not accumulate along this wall to the point where it contacts wooden roof members. All soil should be kept clear from any wood (including the window framing on the north side) so that moisture does not wick into the wood from the ground. Vegetation should also be kept clear of the immediate perimeter of the building.

When portions of the mortar joints were repointed, an incompatible material was used (Portland cement). Cracking is evident where the harder Portland cement was used, indicating a lack of elasticity in the mortar to "give" to thermal movements and settlement of the building that take place over time. It is recommended that the BLM investigate the content of the historic mortar, and use this recipe in the future for all other repointing work. Ideally, the BLM should remove all incompatible mortar and replace it with mortar of the same content as was used historically. The use of the correct mortar consistency and strength will lengthen the life of the masonry. In addition, the new mortar was not applied to just the joints, as was done historically, but was applied to the actual stone as well. Even on the informal sides of the exterior of the building (all except the front east side), mortar was historically applied carefully to the joints, and there is no evidence of historic mortar slopped over onto the stone.

This type of careless mortar application changes the overall appearance and effect of the historic craftsmanship of the building's masonry. However, preservation, rather than restoration, is recommended in the case of all contributing buildings in the Birch Creek Ranch Historic Rural Landscape, and the BLM should concentrate on maintaining the present integrity of the buildings. If the BLM decides to remove the Portland cement from the stone and mortar joints in the future, extreme caution should be used and the gentlest means should be employed during this procedure (refer to Appendix C). The building will continue to be used as a root cellar by the BLM.

Cistern

Recommendations of Treatment and Use--The cistern should be drained and dried out thoroughly and all leaks to the exterior sealed, particularly around the out-take pipes and hoses. All young vegetation (trees and bushes) surrounding the cistern and shading it from the sun should be cleared from the site. Since there is no evidence that the cistern was shaded by vegetation during the historic period, these modern intrusions to the site can be eliminated. This will help solve the problem of moisture retention of the site. In addition, the root systems may eventually cause structural damage to the cistern since a good portion of the structure is below grade. The BLM may opt to reaffix the rubble stone facing once the walls of the cistern have dried out thoroughly and the leaks repaired. This action is more in line with restoration rather than preservation of the existing integrity of the structure and would improve the aesthetics of the cistern rather than its basic structural engineering. If the facing is to be reaffixed in the future, a concrete mortar of similar consistency to that which was used historically should be applied. An analysis of the masonry bonding material used in the original construction of the cistern should be undertaken to match the new concrete mortar used in the repair of the walls. It is equally important when the cistern is being used that water is not allowed to flow over the top of the structure and that the amount of water being fed into the cistern be regulated carefully. Once repaired, the cistern can be used as it was intended.

Generator Shed

Recommendations of Treatment and Use--The BLM should re-evaluate the historical significance of the generator shed in light of the new information brought forward regarding its age and association. The structure's association with Martin Rust would place it as a non-contributing feature of the ranch because Mr. Rust's stewardship of the property is not within the defined period of historical significance. At present, the shed is not in danger of collapse and is structurally sound. The floor system, though in no danger of failing soon, has deteriorated, and the BLM may consider shoring up the floor and the sill to level the structure as a basic maintenance move, since the shed is still functioning as a utility shelter. The area around the

foundation should be kept free of accumulating soil and an air space kept open under the structure for ventilation.

Though the generator shed may not be 50 years old, the age normally achieved for the designation of "historic" in the eyes of the National Register, its design and materials are still compatible and in keeping with the historic landscape and architectural features of Birch Creek Ranch and does not affect the integrity of the property. The structure will continue to be used as a generator shed by the BLM.

Outhouse (Privy)

Recommendations of Treatment and Use--The foundation and the area surrounding the outhouse should be cleared of organic debris, making sure no soil builds up against the sides of the building. New rolled asphalt sheeting should be applied to the roof, taking care to replace in kind the materials and construction of the roof. The missing wall board on the north side could be replaced in kind and painted to match the others, but this would be more for aesthetic reasons. The BLM may consider repainting the building at some point, but this is not an immediate need. At present, the agency has no plans for the building. Because of sanitation concerns, the outhouse should not be used but can still be interpreted to the public.

Morrison Ranch (Lower Tract)

Root Cellar/Bunkhouse

Recommendations of Treatment and Use--The entire root cellar/bunkhouse should be repointed in the areas needed. Extreme care should be heeded when accomplishing this task so that the building's character-defining historic craftsmanship is not compromised or adversely affected. A mortar analysis should be undertaken to accurately replicate the material used historically when the masonry is repointed in the future.

The small cracks on the interior west wall can be patched using a historically compatible mortar. Usually, these types of cracks do not indicate an immediate problem, and may even be the result of settlement or movement within the wall that has taken place in the past, not necessarily at the present time. The BLM should monitor the wall over time, and if cracking continues or worsens, more intense measures of correcting the problem need to be examined. A structural engineer or architect should then be consulted to diagnose the precise problem and remedy it.

Though the door and windows are modern replacements, general maintenance for these elements should involve keeping the hardware clean and in working condition and oiling the front door. The site surrounding the structure, especially at the base of the building, should be kept clean of organic debris and soil accumulation.

The BLM has not come to a decision about the ultimate use of the root cellar/bunkhouse. They may rent out the building to the public for recreation purposes.

Garage/Shop

Recommendations of Treatment and Use-It is not critical at this time to replace the deteriorated siding on the south side, as long as the ground is kept clear of all soil and organic debris that comes in contact with the building. The entire perimeter of the building should be kept clean of debris and soil build-up along the foundation. An air space should be maintained at the base of each wall between the ground and the sill. The damaged 1x8 blocking on the south side should be replaced, and since it is hidden from view by the exterior siding, it can be replaced using pressure-treated wood for longer preservation. The stone footing in the northwest corner needs to be repaired with the same type of stone so that this corner of the building is level. A layer of gravel could be laid around the outside perimeter of the garage/shop, especially on the south side, to increase site drainage. Care should be taken, however, to not make the gravel intrusive on the integrity of the building and should be subtle in appearance, yet functional.

The panes on all windows can be replaced, and the east window should be reglazed with putty. In lieu of repairing the west window in the shed addition, the BLM may opt to replace it with another old window. Since all of the windows in the garage/shop were reused from other buildings, this action would be in keeping with the historic tradition of construction on the ranch and would be acceptable and historically accurate.

The shed addition should be stabilized in the future to prevent its collapse, but at present, the roof is in need of repair. The use of recycled building materials would be appropriate for the replacement of existing structural members or new stabilizing members, rather than new lumber. The building will continue to be used by the BLM as a garage/shop and storage facility for the maintenance needs of the property.

Stone Dugout/Root Cellar Ruin

Recommendations of Treatment and Use-If the BLM plans to interpret this structure in a ruined state (an acceptable alternative to restoration, in this instance), the

agency need not do any repair or maintenance of the feature. Structural ruins are critically significant elements of the historic cultural landscape and equally relate the feeling and association of the time period and historic context of the property.

If the BLM chooses to interpret the structure as it conveys its present integrity, stabilization and repointing of the masonry walls is required. Care should be taken in replicating the historic mortar as closely as possible. The door should be reset in its framing, and, if replacement of any door framing or features of the door is necessary, it should be done with recycled materials and in a careful manner so that the original design and craftsmanship are not altered. Since the roof form and materials are not exactly known at this time, it is not recommended that the roof be reconstructed.

The site would be ideal for a public educational opportunity in historical archaeology. Two historic artifacts were found outside of the structure, and more may be found during archaeological excavations, both inside and outside of the cellar. Information gained from such investigations may lead to more data on the construction of the cellar as well.

REQUIREMENTS FOR TREATMENT

The Birch Creek Ranch Historic Rural Landscape property must be maintained to meet BLM health and safety standards in a consistent manner with the overall historic character of the ranch. Although historic buildings and structures are often excluded from meeting modern building codes (depending on their intended use), the BLM would like to see that the non-historic buildings at the ranch meet all applicable building codes regarding human safety, fire protection, abatement of hazardous materials, and physical accessibility. Projects geared toward meeting this goal are in the planning stages, but it is critical to the integrity of the property that this work be carried out in a manner unobtrusive and consistent with the appearance of the other buildings and structures that contribute to the historical significance of the ranch.

Public safety requirements include maintaining the dirt road system at the minimum standards (which also includes establishing a mineral materials site for road maintenance needs), installing and/or upgrading utilities (electricity, propane, water, heating and cooling), supplying potable water, providing adequate waste disposal systems, ensuring that the storage of gasoline, motor oil, and diesel fuel is safe and adequate according to applicable laws, and improving the communication system between the ranch and the outside. The BLM will need to plan these projects very carefully to be sensitive to the historic landscape as a whole. Views are one of the most significant features of a rural historic landscape. Modern development, such as a quarry or above-ground utilities, can diminish the integrity of a landscape if their

designs are not well planned and executed. Again, SHPO should be consulted as part of planning for public safety.

ALTERNATIVES FOR TREATMENT

The BLM has identified alternatives for the treatment of the historic buildings and structures in the Birch Creek Ranch Historic Rural Landscape as part of the planning process for an overall site management plan. These alternatives vary in the extent of commitment the BLM would make in maintaining and preserving the buildings:

- (1) follow the recommendations for preservation and maintenance presented in this Historic Structure Report for all contributing buildings,
- (2) take no action in the preservation of the buildings and allow them to deteriorate over time,
- (3) maintain and protect all contributing buildings and structures but remove all non-contributing features, or
- (4) remove all cultural heritage features after documenting the site to Historic American Buildings Survey and Historic American Engineering Record standards (in consultation with SHPO) then allow the site to "go back to nature."

The principal issues the BLM has dealt with regarding the existing buildings and structures at the ranch thus focus on whether to retain contributing as well as non-contributing features, and if retained, how they should be maintained and who is responsible for conducting and funding the maintenance.

Three of the four management alternatives presented by the BLM are inconsistent with the directives of the National Wild and Scenic Rivers Act and the National Historic Preservation Act. To remove all vestiges of human development at the property would be contrary to the goals of both acts which fully support the preservation of a region's cultural heritage. Though the Birch Creek landscape may be significant under the criteria of the National Register because of its natural environment, it is the property's *cultural landscape* that makes it stand out.

Removing only the non-contributing features of the Birch Creek historic landscape would still directly impact the integrity of the site, especially since those features are considered compatible with the historic character of the ranch (Beckham

1989; Bronsdon 1992). One non-contributing building in particular, the Acordagoitia house at the Upper Tract, could easily be brought back to its original historic appearance simply by removing the present exterior siding and deck and should not be written off completely as non-contributing. The Martin Rust house, also at the Upper Tract, presently serves as the caretakers' residence--an economical and logical use for this building--and is tucked away at the edge of the building group. The Rust house does not detract from the character and integrity of the ranch, and, though only 20 years old, is in fact of compatible design and materials with the heritage and tradition of building construction at the ranch.

Both the Wright (Morrison) house and the old stud barn (now known as the "honeymoon cottage") located at the Lower Tract are compatible in design and scale with their historic surroundings as well and do not detract from the historic character of the place. In fact, the removal of the house, especially, may have more of a negative visual effect on the property than its continued existence, since it is so closely tied to the surrounding domestic landscape. As part of the Martin Rust improvements to the property, both buildings in their present condition help interpret an important chapter of the ranch's history of later development, regardless of the change in their physical appearance since the historic period.

Since most of the buildings at the ranch have been identified in the National Register nomination as contributing to the historical significance and integrity of the property, the managing agency is responsible for ensuring that they continue to contribute to the ranch's significance and integrity. Allowing them to deteriorate over time (an action known as "benign neglect") is not considered a viable option, since they would eventually lose integrity from their original appearance at the time the property was determined eligible. It is this appearance that made these buildings significant in the first place.

By choosing preservation over restoration or reconstruction as the ultimate treatment for the architectural resources of the Birch Creek Ranch Historic Rural Landscape, the BLM can sustain, in part, the historical essence of the property in a cost-effective manner. Basic stabilization and maintenance of the buildings to sustain their integrity can be accomplished with minimal expenditures as compared to restoration or reconstruction.

The most appropriate alternative under the requirements of NHPA and NWSRA is continued stewardship of the buildings and structures within the Birch Creek Ranch Historic Rural Landscape through a preservation effort. The treatment recommendations for this preservation effort are outlined below. The BLM should refer back to the discussion of each of the buildings in this section of the report for a more detailed explanation of the suggested preservation treatment.

Birch Creek Ranch

- | | |
|------------------|---|
| Barn | <ol style="list-style-type: none"> 1. repair deteriorated portions of sill 2. repair undermined portion of north foundation 3. grade perimeter of barn and underneath barn 4. clear away accumulated dirt, interior west wall/floor 5. clean out rodent droppings periodically |
| Tack Room | <ol style="list-style-type: none"> 1. add exterior bracing to corners and exterior south wall 2. clear away accumulated dirt from foundation and sill 3. repair rubble stone foundation 4. clean out rodent droppings periodically |
| Bunkhouse/Shop | <ol style="list-style-type: none"> 1. grade perimeter of building and keep free of debris 2. recaulk windows 3. replace missing glass in shop door 4. paint window sash and doors 5. brace shop roof |
| Chicken House | <ol style="list-style-type: none"> 1. brace portions of wall framing 2. brace/repair roof framing 3. reroof building with compatible materials 4. clear away accumulated dirt from foundation and sill 5. remove obtrusive vegetation from perimeter of building |
| Root Cellar | <ol style="list-style-type: none"> 1. keep soil from touching roof framing and window 2. keep vegetation cleared from perimeter of building 3. repoint masonry, when necessary, using soft mortar |
| Cistern | <ol style="list-style-type: none"> 1. drain cistern and repair leaks on the inside 2. remove obtrusive vegetation around structure |
| Generator Shed | <ol style="list-style-type: none"> 1. shore-up floor 2. clear away accumulated dirt from foundation and sill |
| Outhouse (Privy) | <ol style="list-style-type: none"> 1. reroof with asphalt sheeting 2. clean periodically |

Morrison Ranch

Root Cellar/Bunkhouse

1. monitor wall cracks
2. clear away accumulated dirt from perimeter of building
3. keep vegetation cleared from perimeter of building
4. clean door and window hardware
5. oil door and window frames periodically

Garage/Shop

1. repair stone footing, northwest corner
2. repair damaged blocking, south interior wall
3. clear away accumulated dirt from foundation and sill
4. grade perimeter of building
5. replace window panes and repair sash
6. stabilize north shed addition

Stone Dugout/Root Cellar Ruin

1. stabilize masonry walls
2. repoint masonry using soft mortar
3. reset door and shore-up door framing

4. RECORD OF TREATMENT

This chapter discusses any treatment that has been accomplished on the historic buildings in the Birch Creek Ranch Historic Rural Landscape and should be updated with supplements as preservation projects are completed in the future. This Historic Structure Report is meant to be an open-ended and evolving document that can be added to as new preservation issues come up pertaining to the buildings and structures at the two ranches. At this time, only specific features of the property, namely the buildings that contribute to its historical significance, are covered under this Historic Structure Report document. In the future, other buildings (such as the Acordagoitia house) and related structures (namely the wood and rubble stone corrals and fences) should be added to this document. Thus, a record of all preservation work for the ranch buildings and structures accomplished in the recent past, as well as work anticipated for the future, can be compiled in this single document.

Summaries of all preservation projects should be added to this section of the Historic Structure Report as they are planned and carried out, including as-built drawings, supporting photographic materials, specifications, summary assessments, and any correspondence between the BLM and SHPO relating to these specific preservation projects. At the conclusion of each project, a brief completion report should be drafted to summarize the following:

1. the intent of the work
2. the way in which the work was approached and accomplished
3. the time required to do the work
4. the cost of the work

Any additional information about the history of the building found during project construction should also be stated in this report, and the reports can then be attached to this Historic Structure Report in an appendix.

To date, one preservation project has been completed at Birch Creek Ranch for the root cellar, the documentation of which can be found in Appendix E. SHPO concurrence was sought prior to the project's commencement and was performed in-house during September 1993. The work involved replacing the roof system and interior shelving and storage bins in-kind, cleaning the exterior masonry, and repointing the masonry on the exterior and interior so the building could continue to be used as a dry goods storage facility. The BLM used the *Secretary of the Interior's Standards for Rehabilitation and Guidelines for Rehabilitating Historic Buildings* (1990b) to guide them in choosing the appropriate construction materials and methods. Since

the time the work was completed, the National Park Service has fine-tuned and sharpened the focus of standards for the treatment of historic properties (first written in 1978) in an attempt to spread the use of a more universal language for historic preservation projects. The publication, entitled *The Secretary of the Interior's Standards for the Treatment of Historic Properties with Guidelines for Preserving, Rehabilitating, Restoring, & Reconstructing Historic Buildings* (Weeks and Grimmer 1995) has recently come out in its most revised form (excerpts of the Standards are included in Appendix C). The BLM is urged to use the 1995 standards in any future preservation work at the Birch Creek Ranch Historic Rural Landscape.

RECOMMENDATIONS FOR FUTURE WORK

It is important to remember that Birch Creek Ranch Historic Rural Landscape is eligible to the National Register as a *rural historic landscape*, and though the buildings contribute to the significance of that landscape, they are incidental once taken out of the context of the landscape. The primary significance of Birch Creek Ranch Historic Rural Landscape lies in how *all* of its parts--plantings, roads, fences, corrals, irrigation works, archaeological remains, as well as buildings and structures--convey the heritage of this particular cultural property.

The BLM should view this study as a preliminary phase in the total management of the property as a rural historic landscape. It is critical that the agency continue to document and inventory all of the cultural features that characterize the Birch Creek Ranch Historic Rural Landscape and to amend this Historic Structure Report to include all features that contribute to the significance and integrity of the property. This can be accomplished through a series of recommended historic preservation-related projects:

1. complete a *Historic Plant Inventory* (an examination of all plants associated with the cultural development of the property, including name, condition, age, size, distribution, and any notable botanic characteristics) and a more comprehensive *Cultural Landscape Inventory* (an intensive reconnaissance survey and documentation of all cultural landscape characteristics within the boundaries of the property) of Birch Creek Ranch Historic Rural Landscape;
2. incorporate the data from these inventories into a *Cultural Landscape Report* document;
3. update and amend the National Register nomination for the Birch Creek Ranch Historic Rural Landscape; and

4. draft a Preservation Maintenance Guide document for the landscape as a whole.

Cultural Landscape Report

The National Park Service is currently working on an assistance guide to help federal agencies and others draft Cultural Landscape Reports. Though the guide is not available yet, the BLM can turn to Preservation Briefs 36: *Protecting Cultural Landscapes* (Birnbaum 1994) attached in Appendix C and National Register Bulletin 30: *Guidelines for Evaluating and Documenting Rural Historic Landscapes* (McClelland et al. 1990) for an introduction to cultural landscape reporting. The National Park Service defines a Cultural Landscape Report as follows:

A Cultural Landscape Report (CLR) is the primary guide to treatment and use of a cultural landscape. Based on the historic context provided in a historic resource study, a CLR documents and evaluates the character-defining features, materials, and qualities that make a landscape eligible for the National Register. It analyzes the landscape's development and evolution, modifications, materials, construction techniques, geographical context, and use in all periods, including those deemed not significant. Typically interdisciplinary in character, it includes documentation, analysis, and evaluation of historical, architectural, archeological, ethnographic, horticultural, landscape architectural, engineering, and ecological data as appropriate. It makes recommendations for treatment consistent with the landscape's significance, condition, and planned use. A CLR's scope and level of investigation will vary depending on management objectives. It may focus on an entire landscape or on individual features within it (Sasser 1995; Birnbaum 1994).

A Cultural Landscape Report for Birch Creek Ranch Historic Rural Landscape should include the inventory and documentation of existing landscape conditions (including a historic plant inventory and archaeological inventory) and drafting a treatment plan for plant materials, archaeological sites, and other architectural, landscape architectural, and engineering features (ditches, water wheel, fences, corrals, etc.) not addressed in this Historic Structure Report. The treatment plan should cover landscape preservation, rehabilitation, restoration, and reconstruction and should provide recommendations for public interpretation of the landscape. The drafting and implementation of a Preservation Maintenance Guide for landscape features based on data and recommendations in the CLR would be the document the BLM would turn to for appropriate care of the landscape. The guide would also cover routine repair and maintenance to the buildings and structures at the property as well as fences, corrals, ditches, and other landscape features.

National Register Nomination Update

During the course of this study, additional historical information pertaining to some of the contributing buildings in the Birch Creek Ranch Historic Rural Landscape was brought to light. Through the efforts of the BLM ranch caretakers, valuable historical data has been obtained from local informants, namely Alfonso Acordagoitia who grew up at Birch Creek Ranch and George Wright who purchased the Morrison Ranch from James Morrison himself. However, there are still a number of questions about when specific buildings were erected and landscape improvements were made that have yet to be answered.

In addition, since the property has not been systematically surveyed for cultural resources on a reconnaissance level, other cultural features on the property may be found to contribute to the historical significance of Birch Creek Ranch Historic Rural Landscape. Two examples of features not discussed in the 1989/1992 National Register nomination that are important to the interpretation of the Morrison Ranch in particular are the pole horse traps located in gaps in the canyon walls high above the ranch headquarters and the site of the original James Morrison house near the water wheel. There may be other sites, objects, or constructs related to the property that have yet to be discovered.

It is recommended that the BLM make plans to amend the National Register nomination to reflect new information. A reconnaissance survey of the entire historic district would complete the inventory of cultural features characterizing the heritage of Birch Creek Ranch Historic Rural Landscape, and this data should be incorporated into the National Register nomination.

Preservation Maintenance Plan

On-going maintenance and inspection of the Birch Creek Ranch Historic Rural Landscape buildings and structures are key to their continued preservation. Regularly scheduled maintenance will also provide updated information on the condition of building materials and structural systems so that priorities for work can be identified, budgeted for, and efficiently carried out. Following a carefully drafted Preservation Maintenance Plan will ensure the proper upkeep of integrity and preservation treatment for the historic buildings and structures at the ranch. The maintenance plan can be drafted by the BLM maintenance staff, a preservation professional, or through a collaboration between both parties. It is important, however, that the plan developers be particularly sensitive and responsive to the special needs of historic buildings and the special care they require.

The Preservation Maintenance Plan should include schedules for inspection, routine maintenance, housekeeping, appropriate procedures for executing maintenance, and a continuing record of all work performed. General maintenance can include building code compliance (when applicable), selective remodeling or restoration, salvaging of materials, vegetation control, site grading, underpinning and other foundation work, upkeep of flashing and roofing, crawl space grading, and window and door repair.

Sample worksheets for recording maintenance and repair can be found in Appendix F. All work done to the buildings at the Birch Creek and Morrison ranches should be documented on these worksheets and kept with other records of preservation work completed for Birch Creek Ranch Historic Rural Landscape buildings and structures.

Guides for developing a maintenance schedule can be found in a number of publications available through SHPO, the National Park Service, and the National Trust for Historic Preservation. Among the most popular is *Cyclical Maintenance for Historic Buildings* (Chambers 1976) available from the Preservation Assistance Division of the National Park Service. The Park Service has also published an annotated bibliography on maintaining historic buildings (National Park Service 1990a) covering maintenance plans, general building maintenance, maintenance of specific materials and building elements, and housekeeping. This is the most comprehensive compilation of publications on historic building maintenance available to date.

The National Trust publishes a number of books under their Respectful Rehabilitation series as well. Mark London's *Masonry* (1988) text is among the best for the detailed care of brick, stone, and concrete materials. Maintenance for plant materials is discussed both in Birnbaum (1994) and Meier and Mitchell (1990) and have been included in Appendix C.

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APPENDIX A

Glossary of Terms Used in the Preparation of Historic Structure Reports (From Sasser 1995)

Character-Defining Features

A prominent or distinctive aspect, quality, or characteristic of a historic property that contributes significantly to its physical character. Structures, objects, vegetation, spatial relationships, views, furnishings, decorative details, and materials may be such features.

Cultural Landscape Report

The primary guide to treatment and use of a cultural landscape. Based on the historic context provided in a historic resource study, a CLR documents and evaluates the character-defining features, materials, and qualities that make a landscape eligible for the National Register. It analyzes the landscape's development and evolution, modifications, materials, construction techniques, geographical context, and use in all periods, including those deemed not significant. Typically interdisciplinary in character, it includes documentation, analysis, and evaluation of historical, architectural, archaeological, ethnographic, horticultural, landscape architectural, engineering, and ecological data as appropriate. It makes recommendations for treatment consistent with the landscape's significance, condition, and planned use. It may focus on an entire landscape or on individual features within it.

Historic American Buildings Survey (HABS)/Historic American Engineering Record (HAER)

Architectural and engineering programs administered by the National Park Service to produce an archival record of buildings, engineering structures, and cultural landscapes significant in American history and the growth and development of the built environment.

Historic Property

A district, site, building, structure, or object significant in American history, architecture, engineering, archaeology, or culture at the national, state, or local level.

Integrity

The authenticity of a property's historic identity, evidenced by the survival of physical characteristics that existed during the property's historic or prehistoric period; the extent to which a property retains its historic appearance.

National Register of Historic Places

Authorized by the National Historic Preservation Act of 1966 and administered by the National Park Service, the register is the nation's official list of districts, sites, buildings, structures, and objects in both public and private ownership that are significant in American history, architecture, engineering, archaeology, and culture. The National Register includes historical areas of the national park system, properties designated by the Secretary of the Interior as national historic landmarks, properties nominated by SHPOs and federal preservation officers, and cultural properties on the World Heritage List. There are 63,000 properties listed in the National Register. These properties contain approximately 809,000 buildings. It is estimated

that 12% of buildings over 50 years old are eligible for the register and that 3% of all buildings in general are eligible.

Preservation

The act or process of applying measures necessary to sustain the existing form, integrity, and materials of a historic property. Work, including preliminary measures to protect and stabilize the property, generally focuses upon the ongoing maintenance and repair of historic materials and features rather than extensive replacement and new construction. New additions are not within the scope of this treatment; however, the limited and sensitive upgrading of mechanical, electrical and plumbing systems and other code-required work to make properties functional is appropriate within a preservation project.

Reconstruction

The act or process of depicting, by means of new construction, the form, features, and detailing of a non-surviving site, landscape, building, structure, or object for the purpose of replicating its appearance at a specific period of time and in its historic location.

Rehabilitation

The act or process of making possible a compatible use for a property through repair, alterations, and additions while preserving those portions or features which convey its historical or cultural values.

Restoration

The act or process of accurately depicting the form, features, and character of a property as it appeared at a particular period of time by means of the removal of features from other periods in its history and reconstruction of missing features from the restoration period. The limited and sensitive upgrading of mechanical, electrical and plumbing systems and other code-required work to make properties functional is appropriate within a restoration project.

APPENDIX B

*National Park Service Historic Structure Report Standards
(National Park Service 1995)*

MODEL HSR TABLE OF CONTENTS

- i. Cover Page
- ii. Table of Contents
- iii. Executive Summary. This introductory text provides a concise account of (a) research done to produce the HSR, (b) major research findings, (c) major issues identified in the task directive, and (d) recommendations for treatment or use. Deviations from general planning documents should be identified here and discussed more fully in the body of the report.
- iv. Administrative Data. This section contains (a) names, numbers, and locational data used to refer to the historic structure, (b) the proposed treatment of the structure including the source document, (c) related studies, (d) cultural resource data including date listed in the National Register, period of significance, and context of significance, and (e) recommendations for documentation, cataloging, and storage of materials generated by the HSR.

PART 1. DEVELOPMENTAL HISTORY

- A. Historical Background and Context. This section briefly describes the people and events associated with the structure. The section should establish a recommended period or periods of significance if this has not been done in the National Register nomination or historic resource study (HRS).
- B. Chronology of Development and Use. Physical construction, modification, and use of the structure is summarized in this section. The text should be based on historical documentation with corroboration from first-hand observation and materials analysis.
- C. Physical Description. This section contains a systematic accounting of all features, materials, and spaces according to age, significance, and condition. Copies of computer-generated inspection reports should be included in the appendix but summarized in the body of the chapter. The text should also discuss causes of deterioration and structural adequacy.

PART 2. TREATMENT AND USE

- A. Ultimate Treatment and Use. This narrative discusses and analyzes the ultimate treatment and use of the structure as defined in park planning documents. If they have not been defined, this section may recommend an ultimate treatment and use. If analysis of the structure suggests that a planned treatment or use would adversely affect it, the text may present an alternative approach.
- B. Requirements for Treatment. In concise terms, this text outlines applicable laws, regulations, and functional requirements. Specific attention should be given to issues of human safety, fire protection, energy conservation, abatement of hazardous materials, and handicapped accessibility.
- C. Alternatives for Treatment. This section presents and evaluates alternative approaches to realization of the ultimate treatment. Alternatives are presented in both text and graphic form. Analysis addresses the adequacy of each solution in terms of impact on historic materials, effect on historic character, compliance with NPS policy, and other management objectives. The section concludes with elaboration on the recommended course of action and specific recommendations for preservation treatments.

PART 3. RECORD OF TREATMENT

- A. Completion Report. This section summarizes (a) the intent of the work, (b) the way in which the work was approached and accomplished, (c) the time required to do the work, and (d) the cost of the work. It also describes any information about the history of the structure based on physical evidence discovered during construction.
- B. Technical Data. This portion of the report contains copies of field reports, material data sheets, field notes, correspondence, accounting spread sheets, and contract summaries.

APPENDIX

Bibliography
Drawings
Photographs
Materials Analysis

compliance process. Research involving prehistoric and some historic structures may also require consultation with Native Americans or other associated ethnic groups.

a. **Historic Structure Report**

The historic structure report (HSR) is the primary guide to treatment and use of a historic structure and may also be used in managing a prehistoric structure. A separate HSR should be prepared for every major structure managed as a cultural resource. Groups of similar structures or ensembles of small, simple structures may be addressed in a single report. In no case should restoration, reconstruction, or extensive rehabilitation of any structure be undertaken without an approved HSR, Parts 1 and 2.

An HSR includes the following:

Management Summary. This is a concise account of research done to produce the HSR, major research findings, major issues identified in the task directive, and recommendations for treatment and use. Administrative data on the structure and related studies are included.

Part 1, Developmental History, is a scholarly report documenting the evolution of a historic structure, its current condition, and the causes of its deterioration. It is based on documentary research and physical examination. The scope of documentary research may extend beyond the physical development of the structure if needed to clarify the significance of the resource or to refine contextual associations; however, major historical investigation of contextual themes or background information should be conducted as part of a historic resource study. If the Inventory and Condition Assessment Program (ICAP) is used to describe the nature and condition of features, resultant reports (e.g., the historic asset assessment report) should be included in the HSR's appendix.

Part 2, Treatment and Use, presents and evaluates alternative uses and treatments for a historic structure. Emphasis is on preserving extant historic material and resolving conflicts that might result from a structure's "ultimate treatment." Part 2 concludes by recommending a treatment and use responding to objectives identified by park management. In most cases, design work does not go beyond schematics.

Part 3, Record of Treatment, is a compilation of information documenting actual treatment. It includes accounting data, photographs, sketches, and narratives outlining the course of work, conditions encountered, and materials used.

All aspects of a historic structure and its immediate grounds should be addressed in an HSR. Potential overlaps with other cultural resource types and natural resource issues should be identified, and applicable studies and reports should be called for or referenced. An HSR and analogous reports (e.g., a cultural landscape report) may be combined to address multiple resource types at a single property or area.

Parts 1 and 2 of an HSR should be prepared jointly as part of a comprehensive effort soon after acquisition of a structure or recognition of its status as a cultural resource. Given funding and time constraints, however, an HSR may be prepared incrementally. Incremental research and design should also be considered when a complete HSR does not exist or an existing HSR does not adequately address aspects of a proposed treatment such as replication of missing features, removal of significant features or large amounts of historic material, or introduction of new systems or exterior additions. In no case should a Part 2 be prepared without a Part 1.

The scope, level of investigation, and extent of schematic development are outlined in a task directive that is based on the recommendations of the regional historical architect in consultation with other regional cultural resource specialists and the park manager. Major factors considered in developing the task directive include the structure's significance, condition, and intended use. The task directive should also address participation of other cultural resource specialists and publication of the document.

The following standards apply:

- A historic structure report (HSR) is prepared to minimize loss of character-defining features and materials whenever existing information about the developmental history and condition of the historic structure does not provide an adequate basis upon which to address anticipated management objectives, whenever alternative courses of action for impending treatment and use could have adverse effects, or to record treatment.
- Architectural, landscape, and archeological investigations supporting an HSR have the least possible impact on the property studied and employ nondestructive methods to the maximum extent possible; they are prescribed and justified in a task directive that includes a research design and impact analysis.

b. Graphic Documentation

Documentation of historic structures is undertaken to record preservation treatment, provide a baseline for monitoring, aid in interpretation, support scholarly research, and serve as an objective reference for repair or reconstruction in the event of damage or loss. The scope, method, and level of documentation of a structure should be proportional to its significance as a cultural resource, the character of its features, the degree to which it is endangered, and the ways in which the documentation is most likely to be used.

All documentation is done in conformance with the *Secretary of the Interior's Standards for Architectural and Engineering Documentation* (see Appendix C). Where recording is done to establish a baseline for planning or before demolition, the following documentation levels are recommended: Level I for Category Ia structures, Level II for Category

Ib structures, Level III for Category II structures, and Level IV for Category III structures.

New materials and replacement features introduced should be recorded in place with photographs or drawings that clearly indicate their extent. Physical evidence of the developmental history of a structure should be recorded before being removed or covered during treatment. Copies of task directives, daily reports, and change orders should also be retained in park files.

c. Archival Considerations

Although comprehensive, in-depth research is an ideal foundation for preservation work, most information about historic structures is collected on a piecemeal basis throughout the resource management process. Primary information sources include contextual studies, records of treatment, records of structural monitoring, photographic and graphic documentation, and reports of material analysis and archival research. To maximize the benefit of this work and minimize potential data loss, all field notes, primary documents, original maps, drawings, photographs, material samples, and oral histories generated during resource management are organized and preserved as archival material or museum objects in consultation with the park or regional curator.

C. Planning

Planning for historic structures encompasses such diverse activities as involvement in park planning, facility design, preparation of maintenance work procedures, and compliance. The central purpose of all such activities is to identify ways of protecting cultural resources while achieving other management objectives. This is usually best done by thoughtful evaluation of a diverse range of alternatives.

General direction for managing a park's historic structures is provided in its general management plan, development concept plan(s), interpretive prospectus, and resources management plan. Action plans that may affect historic structures include historic furnishing reports and cultural landscape reports. Historic structures may also figure prominently in planning for special populations and fire and energy management.

Treatment and use are the central issues in planning for historic structures. Closely related concerns include consideration of park administrative and interpretive needs, compatibility of new and old development, accommodation of building codes and contemporary regulations, and the overall condition of the structures.

APPENDIX C

Technical Assistance Guides

Masonry Repointing excerpts from Mark London, *Masonry: How to Care for Old and Historic Brick and Stone* (1988).

Documentation of Landscape Characteristics excerpt from Linda Flint McClelland, J. Timothy Keller, and Robert Z. Melnick, *National Register Bulletin 30: Guidelines for Evaluating and Documenting Rural Historic Landscapes* (1990).

Preservation Briefs 36 Protecting Cultural Landscapes: Planning Treatment and Management of Historic Landscapes (Birnbaum 1994).

Principles for Preserving Historic Plant Material (Meier and Mitchell 1990).

Secretary of the Interior's Standards for Preservation and Guidelines for Preserving Historic Buildings excerpts from Kay D. Weeks and Anne E. Grimmer, *The Secretary of the Interior's Standards for the Treatment of Historic Properties with Guidelines for Preserving, Rehabilitating, Restoring & Reconstructing Historic Buildings* (1995).

rability or improve working qualities. Modern chemical additives are, as a rule, unnecessary in rehabilitation and restoration and may, in fact, have a detrimental effect on old masonry walls.

Colors

It is best to achieve a color match through the careful selection of sand and binding material; this will produce the most consistent and permanent results. However, if it is not possible to obtain a proper color match, it may be necessary to use a mortar pigment. In fact, in the late 19th century some mortars were colored with pigments to match or contrast with the masonry units; red, brown and black pigments were commonly used.

If colors are required, chemically pure synthetic oxide pigments, which are alkali proof and sun fast, should be specified to prevent bleaching and fading. They should not exceed 10 percent of the volume of the binder (and in the case of carbon black, no more than 3 percent by weight). Organic dyes should not be used because they fade.

Antifreeze compounds

These additives (for example, calcium chlorides) tend to be detrimental to high-lime mortars because they introduce salts, which may later cause efflorescence (page 136), stimulate corrosion of metals in walls and even break down mortar.

Bonding agents

Although chemical, or bonding, agents can improve the bond with old mortar and adjacent surfaces, they are no substitute for proper joint preparation. They unnecessarily increase the strength of the mortar while making it less porous and more brittle; they can affect color (giving a bluish or greenish tinge), reduce breathability and, by dramatically reducing the ability of the mortar to weather, prevent the aggregate from naturally producing a proper color match to old mortar. In addition, it is difficult to clean off mortar mixed with these agents and smeared on the masonry surface.

Air-entraining agents

In northern climates, agents to increase the amount of air in cement mortars are sometimes used to improve their plasticity and resistance to freeze-thaw cycles, although these

agents also may reduce bonding ability and compressive strength. A type 2A lime, which includes an air entrainer, can be used.

THE REPOINTING PROCESS

The difference between a good and a poor repointing job is not always obvious to the unpracticed eye. Merely brushing away the loose mortar and refilling the joint will produce a repointing job that may look good for several months, but within a few years the mortar will pop out of the joints. Good preparation of the joint takes a fair amount of work but is essential to getting a repointing job to last the 50 to 100 years that it should. It is during preparation for repointing that the masonry runs the greatest risk of permanent damage; cleaning out the joint should be done only by experienced workers using hand tools under the close supervision of an experienced mason.

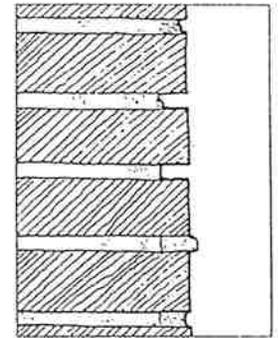
PREPARING THE JOINT

All loose, crumbling, powdery, excessively soft, badly stained or cracked mortar should be raked (cut out) to a uniform minimum depth and the full width of the joint, preferably using hand rather than power tools.

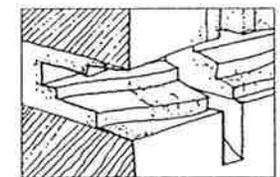
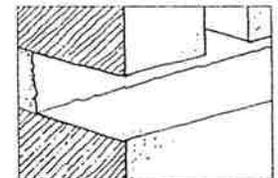
Raking

To ensure an adequate bond, the joint should be raked to a depth equal to between 2 and 2½ times the width of the vertical joint (usually ½ to ¾ inch deep with brick and 1 to 2 inches with wider stone joints). Proper depth ensures that there will be enough surface contact between the mortar and masonry so that surface adhesion and friction will create a good bond without the use of special bonding agents. Any loose and deteriorated mortar beyond this minimum depth should also be taken out. Mortar should be removed cleanly from the masonry, leaving square corners and a flat surface at the back of the cut.

Before filling joints, any bricks or stones that are loose should be reset. Any pieces of brick that chipped off while chiseling out the old mortar can be glued back with ceramic



Joint preparation, top to bottom: Deteriorated mortar, mortar removed, joint properly raked, new mortar, tooled joint.



Top: Well-scraped joint showing an even face and depth of approximately 2½ times the joint's height.

Above: Joint scraped with a radial saw.

glue; stone can be reattached with epoxy. The joints should be finally cleaned out by gently flushing with water to remove all loose particles and dust. At the time of filling, the joints should be damp to prevent the too-rapid absorption of water from the new mortar, but no standing water should be present.

Hand versus power tools

The best way to remove old mortar is by hand using a small-headed chisel, no wider than half the width of the joint. Although handwork is more time consuming than using power tools, it presents far less risk of permanently damaging the brick or stone. If mortar can be removed only with power tools, it probably should not be removed in the first place.

For the most part, power tools such as circular saws with carbide blades or pneumatic impact hammers almost always damage the edges of the masonry units and overcut the ends of joints (especially the vertical joints in a brick wall). Damage to the brick or stone not only affects its visual character but can also lead to accelerated weather damage. Power tools may appear to do an acceptable job when the contractor does a demonstration, but when construction is under way and the day wears on, workers using power tools tire and the masonry inevitably suffers.

Power tools, if they are used to remove masonry joints, should be used only under the most controlled circumstances. Where joints are uniform and wide, it may be possible to begin the removal process using power tools, if the work is done by experienced workers under close supervision. For example, a small power grinder with a 4-inch blade can be used to cut the middle third of continuous horizontal joints; these joints should be finished and vertical joints done entirely with a chisel.

In certain extraordinary circumstances, such as removing portland cement from very narrow joints, very low-power, high-speed power tools in the hands of a skilled worker early in the day might not be as risky as using a hammer and chisel, but only if the mortar really must be removed.

Specifying that the mason or contractor replace all bricks or stones damaged during mortar removal with an exact match is one way to encourage that adequate care is taken to avoid damage (but it could have the unintended effect of encouraging carelessness). Power tools should not be risked on buildings of great significance.

PREPARING THE MORTAR

No single mortar mix can be used for all repointing projects. The mix will depend on the circumstances, particularly the type of masonry and its exposure. Historical research on a building may turn up the original mortar recipe, which is usually a good guide in selecting a mix. Although a century-old mortar eventually deteriorated, this does not mean that anything was wrong with it; mortars have a limited life span.

The table accompanying this section gives an indication of appropriate mixes, based on the durability of the masonry material and the use and exposure of the wall. A pure lime-based mortar is quite slow to cure; while it initially sets in three days, it takes months to develop its strength fully. With soft historic brick and limited exposure, a little white portland cement can be added to speed up setting and improve durability. With hard brick and average-strength stones, the proportion of cement in the binder may be increased from 20 to 40 percent. With highly exposed granite, the cement might make up as much as 50 percent or more.

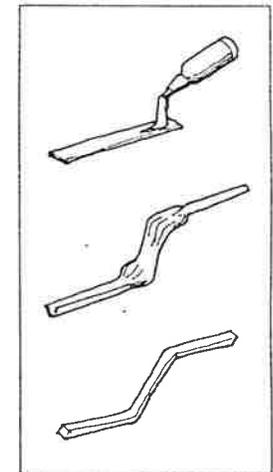
In specifying a mix of materials, proportions should be given in standard volumes, that is, 4 parts of lime to 12 parts of sand, rather than 2 bags of lime to 6 cubic feet of sand. Generally, the ratio is 1 part of binder (lime and cement) to between 2¼ and 3 parts of sand.

Matching the original mortar

Visual analysis of unweathered original mortar is usually sufficient to match the new mortar. The exact physical and chemical properties of the original mortar are not of major significance as long as the new mortar

- Matches the original mortar in color, texture and detailing
- Is softer (measured in compressive strength) than the brick or stone
- Is as soft (measured in compressive strength) as the original mortar

Even if an original mortar recipe is available, it may produce a different-looking mortar using the ingredients available today. Knowing the formula of the existing mortar, however, is a useful aid in developing an appropriate mortar mix for many rehabilitation and most restoration projects and is especially



Repointing tools, from top to bottom: Repointing trowel, convex jointer or round iron, V-shaped jointer.

Top: Handraking, the best and safest way to remove old mortar. (Dean Korpan)

Above: Use of pneumatic tools, acceptable in certain situations when the right tools are used by experienced workers. They should be used rarely with vertical joints such as this. (Philip Marshall)



Preparing mortar. Sand, lime and a small amount of cement are mixed with water on site. (Paul Kennedy)



useful with buildings of special historical significance. Of the many methods for carrying out good chemical and physical analyses of mortars, a simple one that any mason or contractor can follow is outlined in the accompanying box.

To match the old and new mortars, select a broken-off sample of old mortar, snap it in two to expose its interior and compare it directly with a cured test sample of the new mix. Samples from several mixes can be made up to select the closest match. Setting can be speeded up in an oven. Alternatively, the old mortar sample can be wet down and compared with the wet mixed mortar: if they match, they should both dry to the same color. If the new sample matches the unweathered surface of the old mortar sample, it should eventually weather to match the mortar on the building exterior.

Mixing the mortar

Mortar should be mixed carefully to avoid lumps and uneven color and to ensure uniform strength and texture. Dry ingredients should be mixed first before adding any water. Half the water should be added, followed by mixing for approximately five minutes. The remaining water should then be added in small portions until the desired consistency is reached. The proper consistency uses the minimum amount of water to allow the mortar to stick to a trowel held upside-down. More water makes mortar easier to work, but it shrinks more, smears more easily and is not as strong. The total volume of water necessary may vary from batch to batch, depend-

ing on weather conditions. It is best not to work at freezing temperatures or, if this is unavoidable, to warm the sand and water and protect the completed work from freezing.

Mortar should be used before it begins to harden, generally between one and two hours of final mixing. The mortar should not be mixed in too large a quantity. Retempering, or adding more water after the initial mix is prepared, should not be done. A mix of lime and sand (no cement) can be made up in advance and stored in airtight containers; cement is added only when the mortar is used.

BASIC ANALYSIS OF HISTORIC MORTAR

1. With a chisel, remove three or four unweathered samples of the mortar to be matched from several locations on the building. Because the masonry may have been repointed several times, it is important to remove several samples to obtain a mean mortar sample of the different mortars that have been used, avoiding obviously recent samples. Set the largest sample aside to be used later for comparison with the repointing mortar.
2. Break apart the remaining samples, powdering them with a wooden mallet until the mortar is separated into its constituent parts. There should be a good handful of the material.
3. To establish what the binder is, stir part of the sample into diluted hydrochloric acid. If there is a vigorous chemical reaction (bubbling) and most of the binder disappears, leaving clean aggregate, then the binder was lime. Cement will leave a murky liquid and will dissolve very slowly over several days.
4. To establish what the aggregate is, some must be isolated. Take the aggregate left in the previous step and rinse with water and dry. Alternatively, take more of the ground-up sample and carefully blow away the powdery lime or cement binding material; this will not work if the binder is too strongly adhered to the aggregate. Examine the aggregate with a low-power magnifying glass. Note and record the range of color as well as the varying sizes of the individual grains of sand or shell as well as the presence of other materials.

FILLING THE JOINT

The area to be repointed should be damp, but not wet, to slow down the absorption of water from the new mortar before it is properly set; otherwise, the mortar will not cure and adhere properly and thus will be weaker. Freestanding water or excessive dampness will delay the curing or cause excess shrinkage.

Layering mortar

Ideally, the joint should be filled in successive layers, allowing each layer to harden before adding a next. Layering minimizes overall shrinkage, which can reduce the joint's watertightness.

Deeper joint areas — more than 1 inch — should be filled first, compacting the new mortar in several layers until the back of the joint is flat. Then, a 1/8-inch layer of mortar (a few feet long) is applied to the back of the joint, packing it well into the back corners. Several 1/8-inch layers will be needed to fill the joint flush with the surface of the masonry. Each layer of mortar should be allowed to reach thumbprint hardness before the next one is applied. If deep pointing is to be carried out in one operation without layering, the mortar should be stiff (not too wet) and well compacted.

To fill very narrow joints without smearing mortar on the masonry, the mortar can be inserted between two strips of waxed paper that are placed in the joint or masking tape can be used to protect the brick or stone.

Finishing the joint

Sometimes, masons finish joints simply by using a trowel to smooth out the mortar. This type of finishing, however, is not adequate and can actually make the surface more porous by creating a rough texture. To give mortar a smooth, denser outer layer, the joint must be tooled. Even if an untooled joint is being matched, it is generally best to tool and then let the joint weather or treat the surface so it matches.

Tooling

Tooling is the process of smoothing the joint with a finishing tool (slicker) narrow enough to be placed inside the joint. The slicker is pulled over the surface of the mortar to com-



Wetting the area to be repointed and filling the joint. (Paul Kennedy)



Tooling the joint and brushing off excess mortar. (Paul Kennedy)

press it. By bringing the binder to the surface, compressing creates a slick film, often a different color from the rest of the joint. This film, which may initially inhibit water absorption and evaporation, can be allowed to wear off (usually within a year) or it can be carefully removed after pointing.

Proper timing of tooling is essential. If mortar is tooled when it is too soft, the color will be lighter than expected and hairline cracks may occur; tooling when too hard may cause tool burning (dark streaks) and prevent good closure of the mortar against the brick.

Ending the work

When stopping for the day, repointing should end at joints in the building, for instance, vertical elements such as pilasters or the edges of an arch or horizontal elements such as window sills or a stringcourse. In hot weather, a light misting will help slow down the setting and prevent suction from adjacent masonry. Burlap or a tarpaulin can be used to keep off the sun or heavy rain for the first few days.

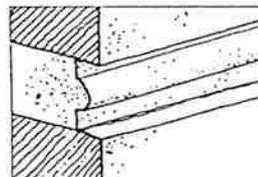
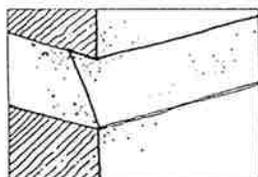
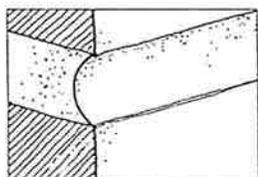
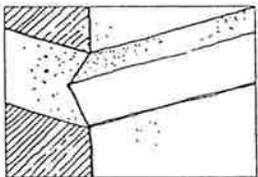
SHAPING THE JOINT

The shape of the joint plays an important part in its efficiency and durability. Pointing styles used on the masonry and methods of producing them should be examined and reproduced to match the original joint profile.

A mortar joint should shed water to avoid the accumulation and penetration of rainwater between the mortar and masonry elements. From this point of view, the best profile is the concave joint; the worst is a joint that projects from the ma-



Using a special tool to make a decorative bead on a foundation joint. (Frank Genello)



Some typical joint shapes, from top to bottom: V-shaped, concave, struck with drip, beaded.

sonry, exposing a wide surface of the mortar to weathering. If the original pointing had joint shapes that did not shed water properly or that had excessively thin edges that have broken off, it would be wise to select a joint shape that resembles the original, but is more technically sound.

The appropriate shape of the joint depends on the type of masonry. Because fieldstone and old brick have irregular edges, completely flush joints should be avoided, as they would leave delicate, thin, feathered edges that could easily break off and allow water to infiltrate; here, joints should be slightly recessed and concave. Flush joints may be appropriate only for thin joints with regularly cut stone or regular brick, but these, too, should be properly tooled, not merely scraped with a trowel.

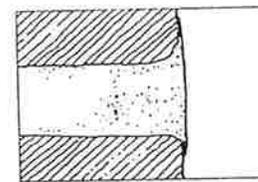
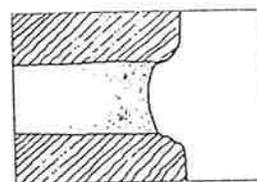
Look at both horizontal and vertical joints to determine the order in which they were tooled and whether they were the same style. Some early 20th-century buildings have recessed horizontal joints while vertical joints were finished flush and pigmented to match the bricks, thus creating the illusion of horizontal bands. Pointing styles also often differed from one facade to another, front walls receiving greater attention to mortar detailing than side and rear walls.

Although the word "tuckpointing" is often used to refer to repointing in general, it originally defined a special kind of joint used to make wide, irregular joints (for example, in rough stonework) resemble thinner and more regular joints associated with costlier construction. The joint was first filled with a mortar colored to match the masonry units, then a narrow groove of about 1/4 inch was made in the colored mortar joint and a strip of white lime mortar was "tucked" in.

CLEANING UP AND FINISHING

Carefully executed repointing should need little cleaning. Bits of mortar that fall off the trowel or are forced from joint edges by tooling are best removed with a stiff dry or lightly dampened brush after the mortar has initially set, but before it is hardened (often 1 to 2 hours, depending on the type of mortar). Hardened mortar can usually be removed with a wooden paddle or, if necessary, a chisel.

Smears on the wall should be cleaned up after a day or two, after the mortar has developed some resistance. This



Packing the joint. Excess mortar leaves edges too thin, (left), allowing water to penetrate. This type of joint also will appear visually uneven and too wide compared to a well-packed joint (far left).

should be done with stiff, natural-bristle brushes and plain water. On glazed or polished surfaces, only soft cloths are appropriate. Because the binder of lime-rich mortars is acid soluble, acetic acid also may be applied with a small brush and flushed with water (see *Cleaning Brick and Stone*). Improper cleaning of a large area, such as with hydrochloric (muriatic) acid, can lead to mortar deterioration and discoloration as well as efflorescence.

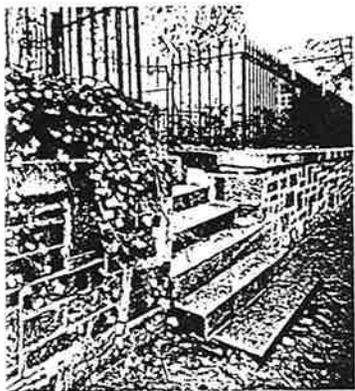
If a full wash-down of the building is required to remove mortar bits (rare in rehabilitation), test panels should be used to evaluate the effects of different cleaning methods. New mortar joints are especially susceptible to damage, because they do not become fully cured for several months. The mortar should be completely hardened before a masonry cleaning project is undertaken; 30 days is usually sufficient, depending on weather and exposure.

In repointing work, new construction "bloom" (efflorescence, page 136) occasionally appears within a few weeks of repointing, although this is rare with lime-rich mortars. It should disappear through normal weathering.

AGING THE MORTAR

Even with the best efforts at matching the old mortar color, texture and materials, a difference will usually be visible, partly because the new mortar has been matched to the unweathered portions of the historic mortar. If the mortars have been properly matched, it is best to let the new one age naturally. No artificial aging technique should be used without careful evaluation and testing.

Various substances (ranging from solutions of potassium permanganate and carbon black to beer and manure) are commonly used to stain the new mortar. Staining is generally an unreliable and unstable technique; it may provide an initial



Repointed stone. The wall in the background was completely rebuilt and repointed using the original stone. Once the mortar has aged, its color will more closely resemble the original mortar in the foreground. (Paul Kennedy)

match but the old and new mortars may weather differently, leading to visual differences after a few seasons. Also, some mixtures used to stain the mortar may be harmful to the masonry (for instance, by introducing salts leading to efflorescence).

Tooling also may affect the look of the joint. The tooled patch may not match an adjacent weathered area where the lime or cement has eroded and the sand is visible on the surface. Also, a smoothly tooled joint may not be visually appropriate for a rough rubble wall.

Two options are available: to allow the joint to weather naturally, which should remove the film in a few months, or to remove the film by rubbing very gently with a damp, soft-bristle brush, such as a toothbrush, or with sacking. Techniques that seriously abrade the surface of the mortar should be avoided.

SCRUB COATING

The terms "slurry coating" and "scrub coating" are used by contractors to describe new techniques that involve brushing a thinned, low-aggregate coat of mortar over the entire masonry surface; when dry, this coat is scrubbed off the brick or stone with a brush, presumably leaving a residue of mortar in the joint. Other methods — "mask and grout" or "tape and grout" techniques — call for taping the edges of the joints to protect the masonry and brushing the slurry into the joints with a brush. These techniques may seem appealing because they are quick and inexpensive compared to traditional repointing and do not require skilled craftsmanship. However, they should not be confused with or substituted for true repointing and are especially inappropriate for historic buildings.

Scrub coating may be of limited use in sealing hairline cracks in the mortar, particularly with very fine joints where repointing would be difficult. For the most part, these superficial cosmetic techniques do more harm than good. They tend to mask joint detailing or tooling, have a life expectancy of only a few years and may be extremely difficult to clean from the surface of the brick without leaving a residue, called veiling.

GUIDE TO MORTAR MIXES

This table gives an indication of the proportion of various mortar ingredients based on the role and location of the masonry as well as the strength of the stone or brick. The letters O, N and S correspond to the equivalent ASTM standards. Type M (very hard) mortars, which are not indicated here, are made with very little lime and are too hard for use with old masonry.

Use	Strength of the Masonry			Mortar Mix		
	Low (marble, weak limestone or sandstone, common brick)	Average (hard limestone or sandstone, facing brick)	High (granite, paving or vitrified brick)	(parts of each ingredient by volume)		
				Portland Cement	Lime	Sand
Interior and Party Walls				Very soft		
				1	4	11-15
Sheltered Exterior Walls				Soft (type O)		
				1	2½	8-10
Normally Exposed Exterior Walls				Medium (type N)		
				1	1¼	7-9
Highly Exposed Exterior Walls				Hard (type S)		
				1	1½	4-5
Paving						

DOCUMENTATION OF LANDSCAPE CHARACTERISTICS

Landscape characteristics are the tangible evidence of the activities and habits of the people who occupied, developed, used, and shaped the landscape to serve human needs; they may reflect the beliefs, attitudes, traditions, and values of these people.

This chart summarizes the kinds of data, gathered through field survey and historic research, to be described on National Register forms. Certain landscape characteristics require location, dating, and detailed description, while others may be described collectively as they contribute to the general character and setting of the landscape. Generally those meeting the definitions used in the National Register for *buildings, structures, objects, and sites*, require the most detail. An asterisk * identifies those characteristics that should be located on sketch maps accompanying National Register forms. Preservation planning and management may call for additional documentation, for example, a detailed site plan of types of vegetation.

The features within a landscape are the physical evidence of past uses, events, and associations. They may reflect a variety of activities occurring at one time, or evolving functions in different periods of time, for example, orchards planted sequentially as a farm's productivity increased. They may or may not be historic, or contributing to the significance for which the landscape meets the National Register criteria. Although the larger and most prominent characteristics require the greatest documentation, those, less prominent, help define the landscape's setting and character, and should not be overlooked. The characteristics of a landscape interrelate and may, in some cases, overlap, for example, cultural traditions may be evident in structures and buildings, spatial organization, vegetation, and clusters.

Characteristics	Features	Documentation
Land Uses and Activities	Fields, pastures, orchards, open range, terraces, commons, cemeteries, playing fields, parks, mining areas, quarries, and logging areas.	<ul style="list-style-type: none"> • Describe principal and significant land uses. • Identify the tangible features related to land uses by type, general location, dates of use, condition, and related vegetation. • Describe historic processes related to land use, such as mining, irrigation, lumbering, contour farming, or quarrying. • Point out obsolete historic operations, ongoing traditional practices, or modern adaptations related to significance. • Identify threats to integrity, and indicate their location, extent, and impact on historic integrity. * Identify areas having major importance or predominance, by location and type, and classify as historic or nonhistoric.

Characteristics	Features	Documentation
Patterns of Spatial Organization	Overall pattern of the circulation networks, areas of land use, natural features, clusters of structures, and division of property.	<ul style="list-style-type: none"> • Describe any patterns characterizing the landscape as a whole. • Relate patterns to land uses and activities, responses to nature, and cultural traditions. • Relate spatial organization to components, including vegetation, boundary demarcations, and circulation networks. • Describe and locate any areas where historic spatial organization is particularly visible or substantially lost.
Response to the Natural Environment	Adaptations to climate and natural features seen in land use, orientation of clusters, construction materials, design of buildings, and methods of transportation.	<ul style="list-style-type: none"> • Describe the physical environment and ecological systems of the region. • Describe the kinds of the features that have resulted from cultural adaptations or responses to the natural environment. * Identify natural features that have major importance or predominance, by name, type, and location.
Cultural Traditions	Land use practices, buildings and structures, ethnic or religious institutions, community organization, construction methods, technology, trades and skills, use of plants, craftsmanship, methods of transportation, and patterns of land division.	<ul style="list-style-type: none"> • Describe land use practices, patterns of land division, institutions, building forms, workmanship, stylistic preferences, vernacular characteristics, use of materials, and methods of construction that have been influenced by cultural tradition. • Identify the sources of cultural influences, and name specific individuals, such as artisans, builders, community leaders, or farmers, responsible for perpetuating or establishing such traditions. • Describe the kinds of features resulting from or exhibiting cultural traditions, and name, date, and locate the primary features reflecting such traditions.
Circulation Networks	Paths, roads, streams, or canals, highways, railways, and waterways.	<ul style="list-style-type: none"> • Describe the principal forms of transportation and circulation routes that facilitate travel within the landscape and connect the landscape with its larger region. • Name, date, and describe principal or significant examples. * Identify principal roadways and other transportation routes, by name, type, and location, and classify as contributing or noncontributing.

Characteristics	Features	Documentation
Boundary Demarcations	Divisions marked by fences, walls, land use, vegetation, roadways, bodies of water, and irrigation or drainage ditches.	<ul style="list-style-type: none"> • Describe the ways in which land ownership and activities are physically divided within the landscape, and discuss the differences between historic and current practices. • Relate boundary demarcations to overall spatial organization and regional patterns of land division. • Identify the predominant features that mark divisions within the landscape and locate important historic ones.
Vegetation Related to Land Use	Functional and ornamental trees and shrubs, fields for cropping, treelines along walls and roads, native vegetation, orchards, groves, woodlots, pastures, gardens, allées, shelter belts, forests, and grasslands.	<ul style="list-style-type: none"> • Describe principal, predominant, and significant vegetation, by type, condition, age, use, and general or specific location. • Discuss changes that have occurred in vegetation since the period of significance. • Relate the function, massing, and details of vegetation to land uses and activities, cultural traditions, and response to the natural environment. • For rotated crops, identify the general types of crops that might be grown over a period of several years.
Buildings, Structures, and Objects	<p>Buildings: residences, schools, churches, outbuildings, barns, stores, community halls, and train depots.</p> <p>Structures: dams, canals, tunnels, mining shafts, grain elevators, silos, bridges, earthworks, and highways.</p> <p>Objects: monuments, threshers, and cider mills.</p>	<ul style="list-style-type: none"> • Describe the kinds of buildings, structures, and major objects present. • Relate the function, form, materials, and construction of buildings, structures, and objects to land uses and activities, cultural adaptations, and response to the natural environment. • Identify patterns and distinctive examples of workmanship, methods of construction, materials, stylistic influences, and vernacular forms. • Describe the condition of historic buildings and structures, and nature of additions and alterations. • Describe the principal and most important buildings, structures, and objects, by name, type, location, date, function, condition, methods of construction, materials, stylistic influence, and, if known, builder. • Discuss the impact of nonhistoric construction and alterations on historic integrity. * Identify all buildings and structures and principal objects, by location, name or number, and type, and classify as contributing or noncontributing.

Characteristics	Features	Documentation
Clusters	Village centers, farmsteads, cross-roads, harbors, and ranching or mining complexes.	<ul style="list-style-type: none"> • Describe the clusters, historic and nonhistoric, found in the landscape, by general location, function, scale, spatial arrangement, density, condition, and composition. • Discuss any patterns visible in the arrangement, location, or presence of clusters, and relate these to spatial organization, cultural traditions, response to the natural environment, and land uses and activities. • Identify principal, representative, or important examples, by name, type, function, and location. • Discuss the impact of nonhistoric development on historic integrity. * Identify all buildings, structures, and principal objects comprising clusters, by type and location, and classify as contributing or noncontributing.
Archeological Sites	Road traces, reforested fields, and ruins of farmsteads, mills, mines, irrigation systems, piers and wharves, and quarries.	<ul style="list-style-type: none"> • Describe the types of archeological sites, their cultural affiliations, and the period of history or prehistory represented. • Indicate the extent of archeological sites within the landscape, their distribution, environmental setting, and general location. • Identify principal sites, by number or name and location, and describe surface and subsurface features, condition, disturbances, and any excavation or testing. * Identify all archeological sites, by site number or name, location, surface and subsurface characteristics, and condition.
Small-scale Elements	Foot bridges, cow paths, road markers, gravestones, isolated vegetation, fence posts, curbstones, trail ruts, culverts, foundations, and minor ruins.	<ul style="list-style-type: none"> • Describe the kinds of elements that collectively add to the landscape's setting, by type, function, general location, and approximate date. • Relate these elements to historic patterns of land use, spatial organization, cultural traditions, boundary demarcations, circulation networks, or vegetation. • Discuss the extent to which the loss of these has cumulatively affected historic integrity.

36 PRESERVATION BRIEFS



Protecting Cultural Landscapes: Planning, Treatment and Management of Historic Landscapes

Charles A. Birnbaum, ASLA



U.S. Department of the Interior
National Park Service
Cultural Resources
Preservation Assistance

Cultural landscapes can range from thousands of acres of rural tracts of land to a small homestead with a front yard of less than one acre. Like historic buildings and districts, these special places reveal aspects of our country's origins and development through their form and features and the ways they were used. Cultural landscapes also reveal much about our evolving relationship with the natural world.

A **cultural landscape** is defined as "a geographic area, including both cultural and natural resources and the wildlife or domestic animals therein, associated with a historic event, activity, or person or exhibiting other cultural or aesthetic values." There are four general types of cultural landscapes, mutually exclusive: *historic sites, historic designed landscapes,*

historic vernacular landscapes, and ethnographic landscapes. These are defined on the Table on page 2.¹

Historic landscapes include residential gardens and community parks, scenic highways, rural communities, institutional grounds, cemeteries, battlefields and zoological gardens. They are composed of a number of character-defining features which individually or collectively contribute to the landscape's physical appearance as they have evolved over time. In addition to vegetation and topography, cultural landscapes may include water features such as ponds, streams, and fountains; circulation features such as roads, paths, steps, and walls; buildings; and furnishings, including fences, benches, lights and sculptural objects.

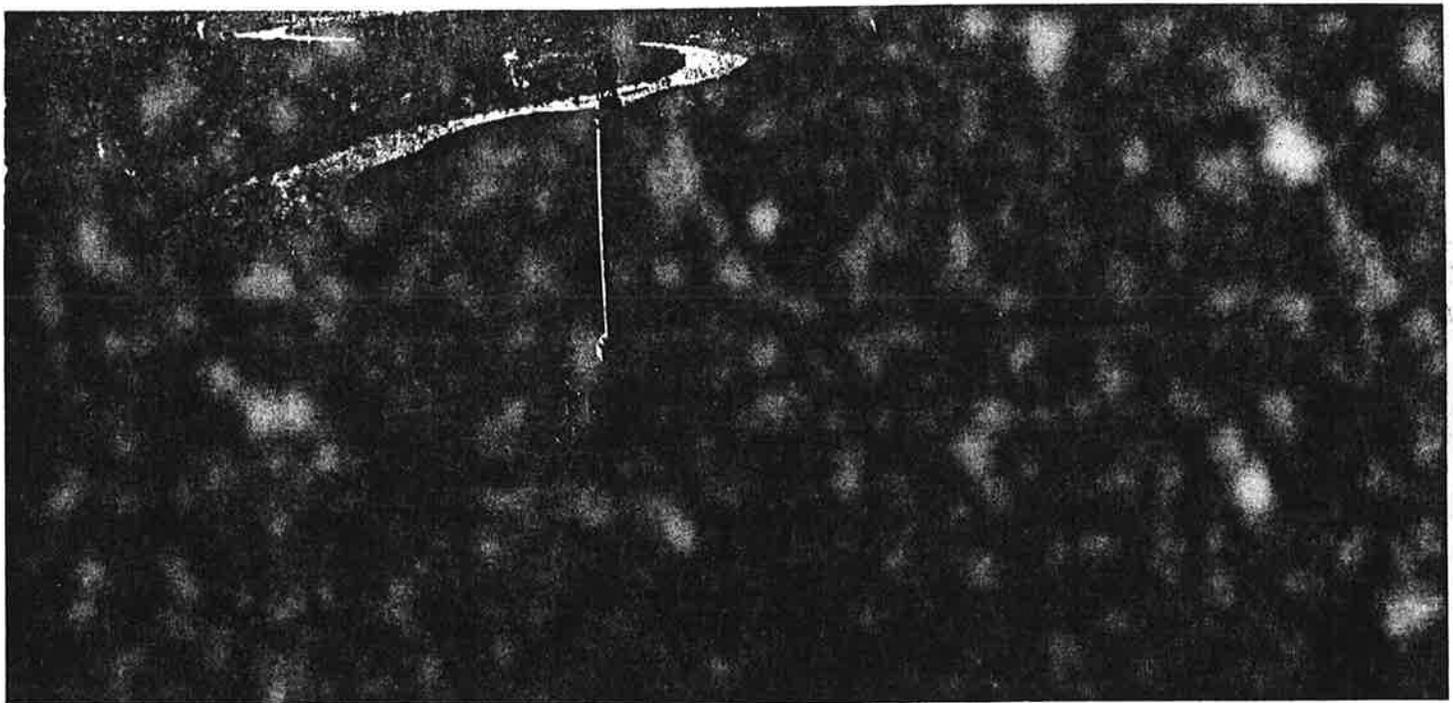


Figure 1: The New York Peace Monument atop Lookout Mountain in the 8,100 acre Chickamauga and Chattanooga National Military Park, Chattanooga, Tennessee, commemorates the reconciliation of the Civil War between the North and South. The strategic high point provides panoramic views to the City of Chattanooga and the Moccasin Bend. Today, it is recognized for its cultural and natural resource value. The memorial, which was added in 1910 is part of this landscape's historic continuum. (courtesy Sam Abell and National Geographic).

DEFINITIONS

Historic Designed Landscape - a landscape that was consciously designed or laid out by a landscape architect, master gardener, architect, or horticulturist according to design principles, or an amateur gardener working in a recognized style or tradition. The landscape may be associated with a significant person(s), trend, or event in landscape architecture; or illustrate an important development in the theory and practice of landscape architecture. Aesthetic values play a significant role in designed landscapes. Examples include parks, campuses, and estates.

Historic Vernacular Landscape - a landscape that evolved through use by the people whose activities or occupancy shaped that landscape. Through social or cultural attitudes of an individual, family or a community, the landscape reflects the physical, biological, and cultural character of those everyday lives. Function plays a significant role in vernacular landscapes. They can be a single property such as a farm or a collection of properties such as a district of historic farms along a river valley. Examples include rural villages, industrial complexes, and agricultural landscapes.

Historic Site - a landscape significant for its association with a historic event, activity, or person. Examples include battlefields and president's house properties.

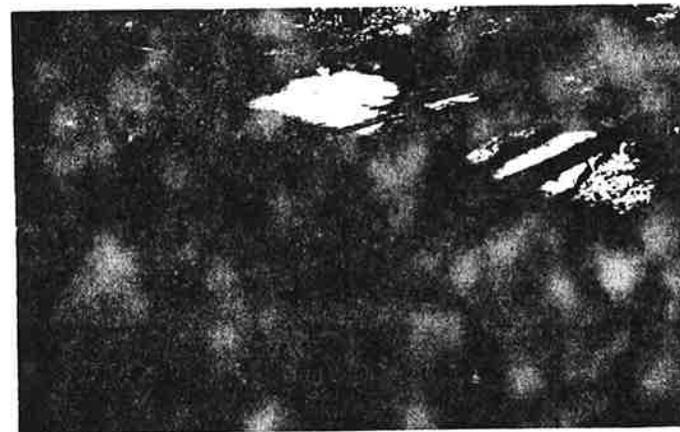
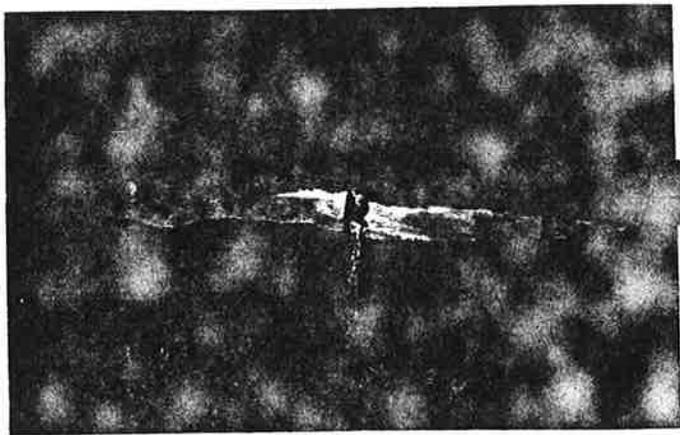
Ethnographic Landscape - a landscape containing a variety of natural and cultural resources. The associated contemporary settlements, religious sacred sites and massive geological structures, small plant communities, animals, subsistence and ceremonial grounds are often components.

Most historic properties have a cultural landscape component that is integral to the significance of the resource. Imagine a residential district without sidewalks, lawns and trees or a plantation with buildings but no adjacent lands. A historic property consists of all its cultural resources — landscapes, buildings, archeological sites and collections. In some cultural landscapes, there may be a total absence of buildings.

This Preservation Brief provides preservation professionals, cultural resource managers, and historic property owners a step-by-step process for preserving historic designed and vernacular landscapes, two types of cultural landscapes. While this process is ideally applied to an entire landscape, it can address a single feature such as a perennial garden, family burial plot, or a sentinel oak in an open meadow. This Brief provides a framework and guidance for undertaking projects to ensure a successful balance between historic preservation and change.

Developing a Strategy and Seeking Assistance

Nearly all designed and vernacular landscapes evolve from, or are often dependent on, natural resources. It is these interconnected systems of land, air and water,



Figures 2-4: Character-defining landscape features (top to bottom): "Boot Fence" near D. H. Lawrence Ranch, Questa, New Mexico, 1991 (courtesy Cheryl Wagner); paving detail at Ernest Hemingway House National Historic Site, Key West, Florida, 1994 (courtesy author); and, tree planting detail for Jefferson Memorial Park, St. Louis, Missouri (courtesy Office of Dan Kiley)

vegetation and wildlife which have dynamic qualities that differentiate cultural landscapes from other cultural resources, such as historic structures. Thus, their documentation, treatment, and ongoing management require a comprehensive, multi-disciplinary approach.

Today, those involved in preservation planning and management for cultural landscapes represent a broad array of academic backgrounds, training, and related

project experience. Professionals may have expertise in landscape architecture, history, landscape archeology, forestry, agriculture, horticulture, pomology, pollen analysis, planning, architecture, engineering (civil, structural, mechanical, traffic), cultural geography, wildlife, biology, ethnography, interpretation, material and object conservation, landscape maintenance and management. Historians and historic preservation professionals can bring expertise in the history of the landscape, architecture, art, industry, agriculture, society and other subjects. Landscape preservation teams, including on-site management teams and independent consultants, are often directed by a landscape architect with specific expertise in landscape preservation. It is highly recommended that disciplines relevant to the landscapes' inherent features be represented as well.

Additional guidance may be obtained from State Historic Preservation Offices, local preservation commissions, the National Park Service, local and state park agencies, national and state chapters of the American Society of Landscape Architects, the Alliance for Historic Landscape Preservation, the National Association of Olmsted Parks, and the Catalog of Landscape Records in the United States at Wave Hill among others.²

A range of issues may need to be addressed when considering how a particular cultural landscape should be treated. This may include the in-kind replacement of declining vegetation, reproduction of furnishings, rehabilitation of structures, accessibility provisions for people with disabilities, or the treatment of industrial properties that are rehabilitated for new uses.

Preservation Planning for Cultural Landscapes

Careful planning prior to undertaking work can help prevent irrevocable damage to a cultural landscape. Professional techniques for identifying, documenting, evaluating and preserving cultural landscapes have advanced during the past 25 years and are continually being refined. Preservation planning generally involves the following steps: historical research; inventory and documentation of existing conditions; site analysis and evaluation of integrity and significance; development of a cultural landscape preservation approach and treatment plan; development of a cultural landscape management plan and management philosophy; the development of a strategy for ongoing maintenance; and preparation of a record of treatment and future research recommendations.

The steps in this process are not independent of each other, nor are they always sequential. In fact, information gathered in one step may lead to a re-examination or refinement of previous steps. For example, field inventory and historical research are likely to occur simultaneously, and may reveal unnoticed cultural resources that should be protected.

The treatment and management of cultural landscape should also be considered in concert with the management of an entire historic property. As a result, many other studies may be relevant. They include management plans, interpretive plans, exhibit design, historic structures reports, and other.

CULTURAL LANDSCAPE REPORTS

A Cultural Landscape Report (CLR) is the primary report that documents the history, significance and treatment of a cultural landscape. A CLR evaluates the history and integrity of the landscape including any changes to its geographical context, features, materials, and use.

CLR's are often prepared when a change (e.g. a new visitor's center or parking area to a landscape) is proposed. In such instances, a CLR can be a useful tool to protect the landscape's character-defining features from undue wear, alteration or loss. A CLR can provide managers, curators and others with information needed to make management decisions.

A CLR will often yield new information about a landscape's historic significance and integrity, even for those already listed on the National Register. Where appropriate, National Register files should be amended to reflect the new findings.

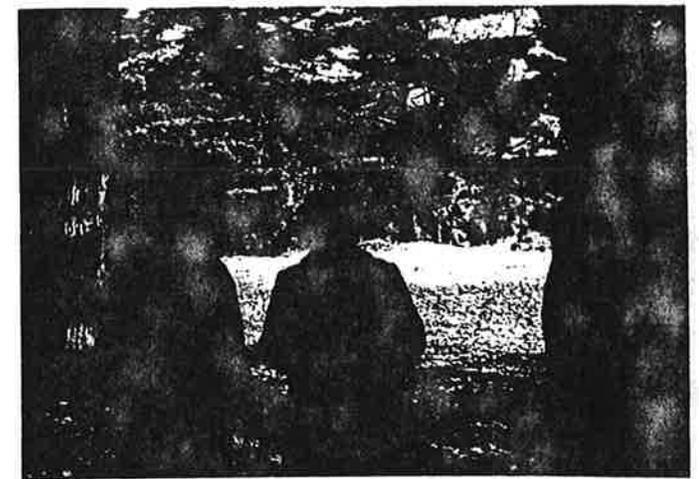
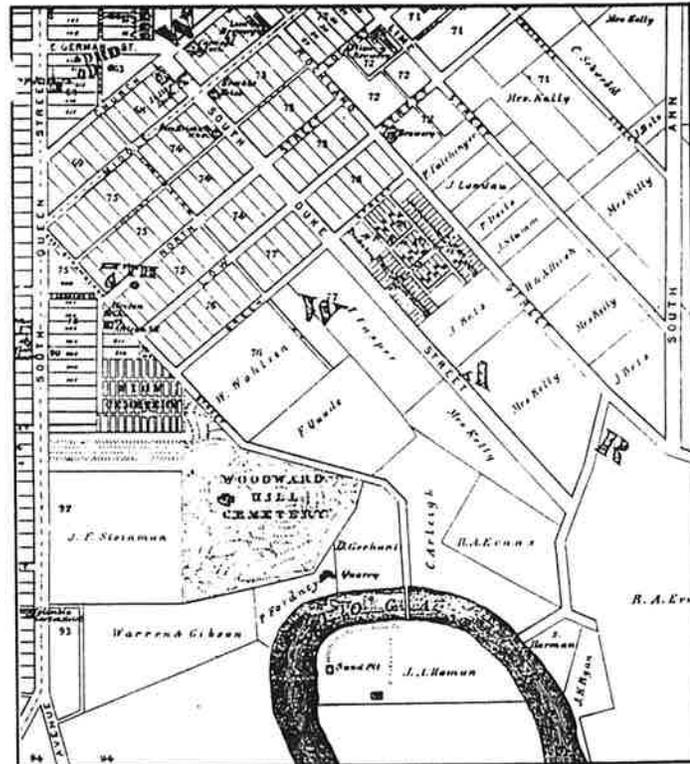
These steps can result in several products including a Cultural Landscape Report (also known as a Historic Landscape Report), statements for management, interpretive guide, maintenance guide and maintenance records.

Historical Research

Research is essential before undertaking any treatment. Findings will help identify a landscape's historic period(s) of ownership, occupancy and development, and bring greater understanding of the associations and characteristics that make the landscape or history significant. Research findings provide a foundation to make educated decisions for work, and can also facilitate ongoing maintenance and management operations, interpretation and eventual compliance requirements.

A variety of primary and secondary sources may be consulted. Primary archival sources can include historic plans, surveys, plats, tax maps, atlases, U. S. Geological Survey maps, soil profiles, aerial photographs, photographs, stereoscopic views, glass lantern slides, postcards, engravings, paintings, newspapers, journals, construction drawings, specifications, plant lists, nursery catalogs, household records, account books and personal correspondence. Secondary sources include monographs, published histories, theses, National Register forms, survey data, local preservation plans, state contexts and scholarly articles. (See Figures 5-7, page 4.)

Contemporary documentary resources should also be consulted. This may include recent studies, plans, surveys, aerial and infrared photographs, Soil Conservation Service soil maps, inventories, investigations and interviews. Oral histories of residents, managers, and maintenance personnel with a long tenure or historical association can be valuable sources of information about changes to a landscape over many years. (Figures 8-9, page 4) For properties listed in the National Register, nomination forms should be consulted.



Figures 5-7: Atlases and aerial photographs were useful for understanding the evolution of burial grounds in Lancaster County, Pennsylvania. Comparing the plans from the 1864 and 1875 atlases (courtesy Lancaster County Historical Society) with a 1980 aerial photograph (courtesy Lancaster County Planning Commission) revealed the growth and development of Woodward Hill Cemetery and its geographic context for over a century.

Figures 8, 9: Mary Smith Nelson spent her childhood at the Zane Grey family compound in Lackawaxen, Pennsylvania. Recently, her recollections of nearly eighty years ago helped landscape architects to document the evolution of this cultural landscape. These oral memoirs have since been confirmed by archeological and archival findings. (courtesy National Park Service, Zane Grey House Archives and LANDSCAPES)

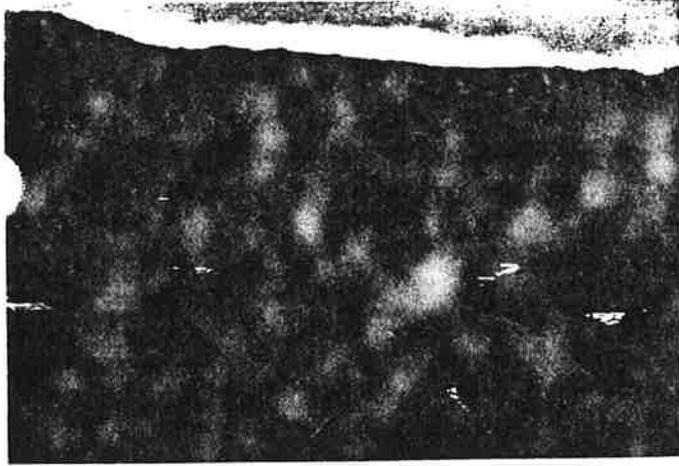


Figure 10: Traditional land uses are often the key to long term preservation. Therefore, a knowledge of prior landscape management practices is essential as part of the research phase. Land use patterns were often the result of traditional activities such as agriculture, fishing or mining. In Hanalei, Hawaii for example, taro fields are important because they reflect the continuity of use of the land over time. (courtesy Land and Community Associates)

Preparing Period Plans

In the case of designed landscapes, even though a historic design plan exists, it does not necessarily mean that it was realized fully, or even in part. Based on a review of the archival resources outlined above, and the extant landscape today, an *as-built period plan* may be delineated. For all successive tenures of ownership, occupancy and landscape change, *period plans* should be generated (see Figure 13, page 6). Period plans can document to the greatest extent possible the historic appearance during a particular period of ownership, occupancy, or development. Period plans should be based on primary archival sources and should avoid conjecture. Features that are based on secondary or less accurate sources should be graphically differentiated. Ideally, all referenced archival sources should be annotated and footnoted directly on *period plans*.

Where historical data is missing, period plans should reflect any gaps in the CLR narrative text and these limitations considered in future treatment decisions (See Treatments for Cultural Landscapes on page 13.)

Inventorying and Documenting Existing Conditions

Both physical evidence in the landscape and historic documentation guide the historic preservation plan and treatments. To document existing conditions, intensive field investigation and reconnaissance should be conducted at the same time that documentary research is being gathered. Information should be exchanged among preservation professionals, historians, technicians, local residents, managers and visitors.

To assist in the survey process, National Register Bulletins have been published by the National Park Service to aid in identifying, nominating and evaluating designed and rural historic landscapes. Additionally, Bulletins are available for specific landscape types such as battlefields, mining sites, and cemeteries.⁶

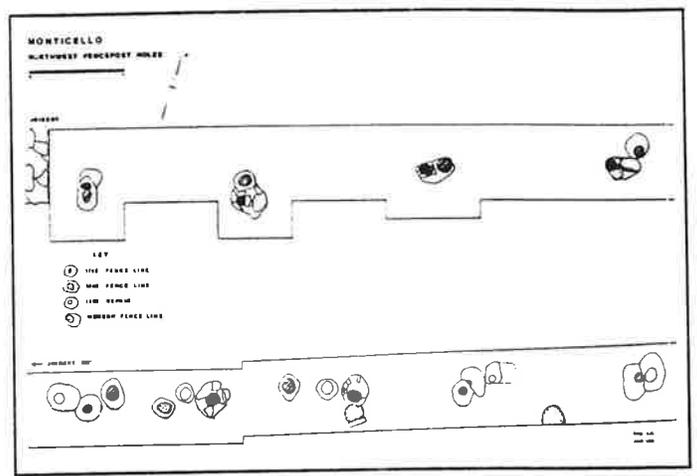


Figure 11: Landscape archeology is an important research tool that can provide location, dating and detail verification for landscape features. At Monticello, the estate of Thomas Jefferson in Charlottesville, Virginia, archeological research has employed both excavational and non-invasive methods. This has included aerial photography, soil resistivity, transect and stratified sampling and photogrammetric recording. As illustrated in the plan above, fence post spacing and alignment can be confirmed with a transect trenching technique.³ (courtesy Thomas Jefferson Memorial Foundation)

Although there are several ways to inventory and document a landscape, the goal is to create a baseline from a detailed record of the landscape and its features as they exist at the present (considering seasonal variations).⁷ Each landscape inventory should address issues of boundary delineation, documentation methodologies and techniques, the limitations of the inventory, and the scope of inventory efforts. These are most often influenced by the timetable, budget, project scope, and the purpose of the inventory and, depending on the physical qualities of the property, its scale, detail, and the interrelationship between natural and cultural resources. For example, inventory objectives to develop a treatment plan may differ considerably compared to those needed to develop an ongoing maintenance plan. Once the criteria for a landscape inventory are developed and tested, the methodology should be explained.

Preparing Existing Condition Plans

Inventory and documentation may be recorded in plans, sections, photographs, aerial photographs, axonometric perspectives, narratives, video—or any combination of techniques. Existing conditions should generally be documented to scale, drawn by hand or generated by computer. The scale of the drawings is often determined by the size and complexity of the landscape. Some landscapes may require documentation at more than one scale. For example, a large estate may be documented at a small scale to depict its spatial and visual relationships, while the discrete area around an estate mansion may require a larger scale to illustrate individual plant materials, pavement patterns and other details. The same may apply to an entire rural historic district and a fenced vegetable garden contained within. (See Figures 14-15, page 8).

When landscapes are documented in photographs, *registration points* can be set to indicate the precise location and orientation of features. Registration points should correspond to significant forms, features and spatial relationships within the landscape and its surrounds (see

HISTORIC LANDSCAPE FEATURES	DEGREE OF DOCUMENTATION					
	SITE EVIDENCE	MANNING PLAN	HISTORIC PHOTOS	LETTERS 1914-1946	1955-1993 RECORDS	SECONDARY SOURCES
NATURAL SYSTEMS/TOPOGRAPHY Bedrock (Quarry) Land Contour Rockwork	▲ ● ● ●	▲ ● ● ●	▲ ● ● ●	▲ ● ● ●	▲ ● ● ●	?
WATER FEATURES Alignment—Cascade Alignment—Pools & Streams Materials—Cascade Materials—Pools & Streams	▲ ● ● ● ●	▲ ● ● ● ●	▲ ● ● ● ●	▲ ● ● ● ●	▲ ● ● ● ●	?
CIRCULATION Alignment—Upland Area Alignment—Perimeter Paths Alignment—Internal Paths Materials—Upland Area Materials—Perimeter Paths Materials—Internal Paths	▲ ● ● ● ●	▲ ● ● ● ● ●	▲ ● ● ● ● ●	▲ ● ● ● ● ●	▲ ● ● ● ● ●	?
SPATIAL RELATIONSHIPS Garden Site (Quarry) Viewshed (Cuvahoga Valley) Vista over Garden from Terrace Views within Garden Views within Upland Views from Croquet Lawn	▲ ● ● ● ● ●	▲ ● ● ● ● ●	▲ ● ● ● ● ●	▲ ● ● ● ● ●	▲ ● ● ● ● ●	?
VEGETATION Native Forest Trees Ornamental Shrubs in Garden Groundcovers in Garden Herbaceous Plants in Garden	▲ ● ● ● ●	▲ ● ● ● ●	▲ ● ● ● ●	▲ ● ● ● ●	▲ ● ● ● ●	?
SITE FURNISHINGS Lanterns Seats	▲ ● ●	▲ ● ●	▲ ● ●	▲ ● ●	▲ ● ●	?
STRUCTURES Torii Gate Cistern Stone Wall Concealing Cistern Lagon Bridges Umbrella House Trellis/Lattice	▲ ● ● ● ●	▲ ● ● ● ●	▲ ● ● ● ●	▲ ● ● ● ●	▲ ● ● ● ●	?

Figure 12: This chart measures available documentation for character-defining features in the Japanese Garden at Stan Hywet Hall, Akron, Ohio designed by Warren Manning. Areas with little or no historic documentation are noted, thus identifying areas where future treatment options may be restricted. As illustrated, restoration or reconstruction are viable alternatives based on the rich research findings. (courtesy Stan Hywet Hall Foundation, Inc. and Doell and Doell)

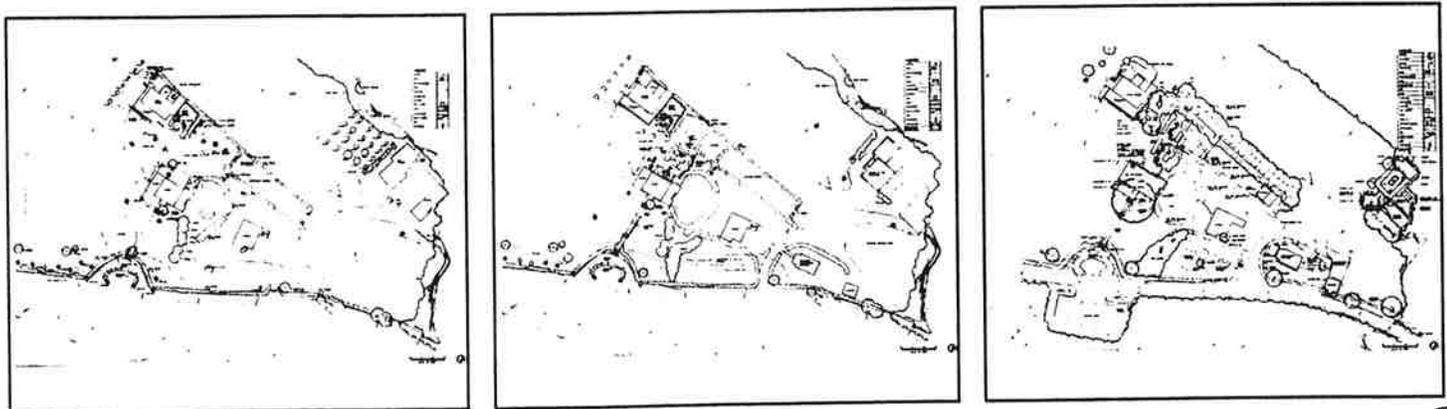


Figure 13: Period plans show the evolution of Aspet, the home of Augustus St. Gaudens, Cornish, New Hampshire. Plans were developed at two scales: first for the entire estate's development, and second for the core area around the house, studio and gardens. For both, plans were generated for five time periods: 1885-1903, 1903-1907, 1907-1926, 1926-1965 and 1965-1992. Illustrated above are the 1885-1903, 1907-1926, and the 1926-1965 plans for the core area. (courtesy National Park Service, North Atlantic Region and Pressley Associates)

READING THE LANDSCAPE

A noted geographer stated, "The attempt to derive meaning from landscapes possesses overwhelming force. It keeps us constantly alert to the world around us, demanding that we pay attention not just to some of the things around us but to all of them—the whole visible world in all of its rich, glorious, messy, confusing, ugly, and beautiful complexity."⁴

Landscapes can be read on many levels—landscape as nature, habitat, artifact, system, problem, wealth, ideology, history, place, and aesthetic.⁵ When developing a strategy to document a cultural landscape, it is important to attempt to read the landscape in its context of place and time. (See Figures 16-17, page 8)

Reading the landscape, like engaging in archival research, requires a knowledge of the resource and subject area as well as a willingness to be skeptical. As with archival research, it may involve serendipitous discoveries.

Evidence gained from reading the landscape may confirm or contradict other findings and may encourage the observer and the historian to consult both primary and secondary sources with a new interest. Landscape investigation may also stimulate other forms of research and survey, such as oral histories or archaeological investigations, to supplement what appeared on-site.

There are many ways to read a landscape—whatever approach is taken should start with a broad overview. This

alignment. This knowledge can prove beneficial before an on-site visit.

Aerial photographs provide clues that can help orient the viewer to the landscape. The next step may be to view the landscape from a high point such as a knoll or an upper floor window. Such a vantage point may provide an excellent transition before physically entering the cultural landscape.

On-ground evidence should then be studied, including character-defining features, visual and spatial relationships. By reviewing supporting materials from historic research, individual features can be understood in a systematic fashion that show the continuity that exists on the ground today. By classifying these features and relationships, the landscape can be understood as an artifact, possessing evidence of evolving natural systems and human interventions over time.

For example, the on-site investigation of an abandoned turn-of-the-century farm complex reveals the remnant of a native oak and pine forest which was cut and burned in the mid-nineteenth century. This previous use is evidenced by a small stand of mature oaks and the presence of these plants in the emerging secondary woodland growth that is overtaking this farm complex in decline. A line count of all trees can establish an accurate record of the forest's other character-defining

relationships. Aerial photographs provide clues that can help orient the viewer to the landscape. The next step may be to view the landscape from a high point such as a knoll or an upper floor window. Such a vantage point may provide an excellent transition before physically entering the cultural landscape. On-ground evidence should then be studied, including character-defining features, visual and spatial relationships. By reviewing supporting materials from historic research, individual features can be understood in a systematic fashion that show the continuity that exists on the ground today. By classifying these features and relationships, the landscape can be understood as an artifact, possessing evidence of evolving natural systems and human interventions over time. For example, the on-site investigation of an abandoned turn-of-the-century farm complex reveals the remnant of a native oak and pine forest which was cut and burned in the mid-nineteenth century. This previous use is evidenced by a small stand of mature oaks and the presence of these plants in the emerging secondary woodland growth that is overtaking this farm complex in decline. A line count of all trees can establish an accurate record of the forest's other character-defining

relationships of the property as it existed a century ago. The number of trees can be tallied and its present condition may be evaluated.

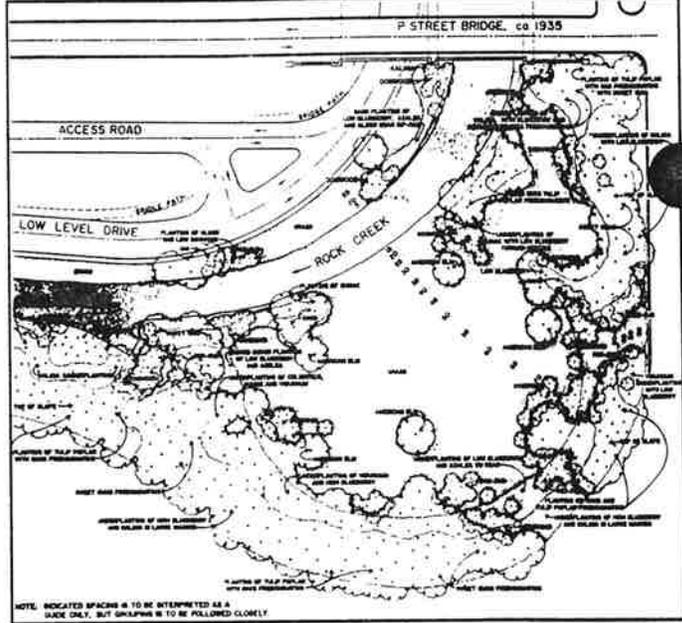
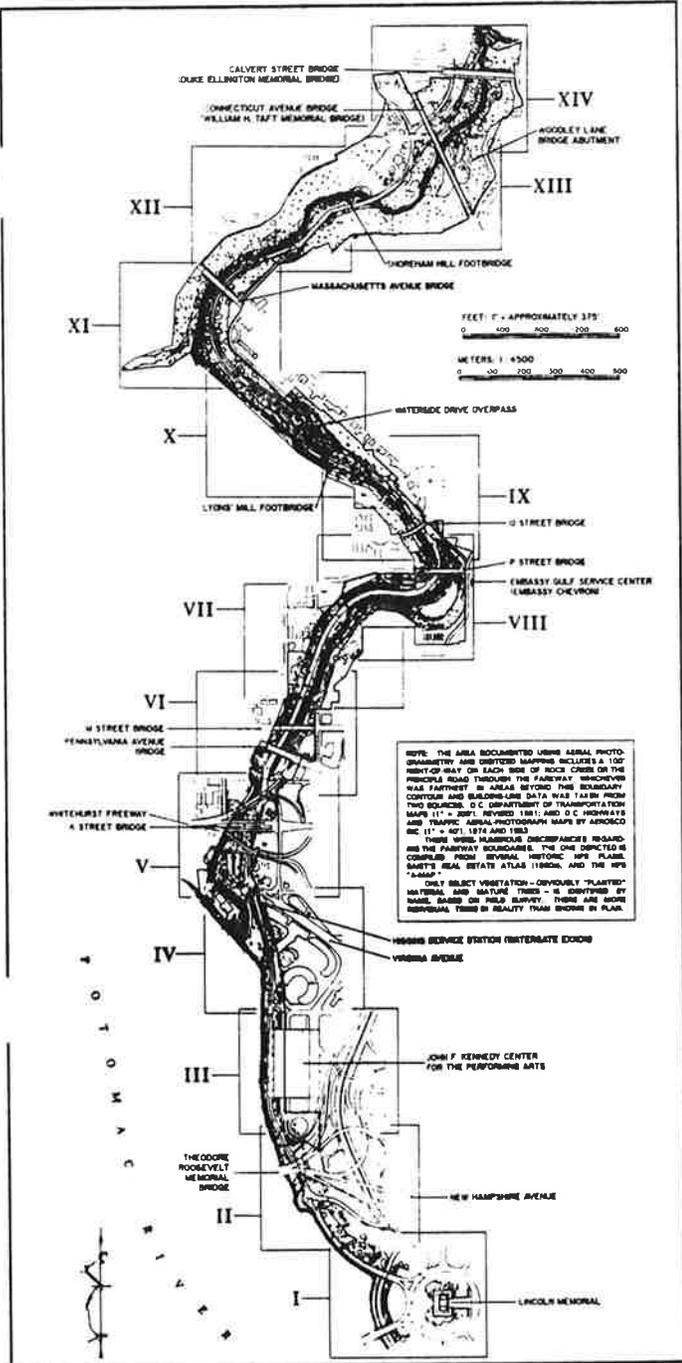
The findings of on-site reconnaissance, such as those uncovered during archival research, may be corroborated. These findings make it possible to interpret and evaluate the landscape's features in the context of the property's current conditions. Character-defining features are located in situ, in relationship to each other and the greater cultural and geographic contexts.

Figure 22, page 11 for an example.) The points may also correspond to historic views to illustrate the change in the landscape to date. These locations may also be used as a management tool to document the landscape's evolution, and to ensure that its character-defining features are preserved over time through informed maintenance operations and later treatment and management decisions.

All features that contribute to the landscape's historic character should be recorded. These include the physical features described on page 1 (e.g. topography, circulation), and the visual and spatial relationships that are character-defining. The identification of existing plants, should be specific, including genus, species, common name, age (if known) and size. The woody, and if appropriate, herbaceous plant material should be accurately located on the existing conditions map. To ensure full representation of successional herbaceous plants, care should be taken to document the landscape in different seasons, if possible.

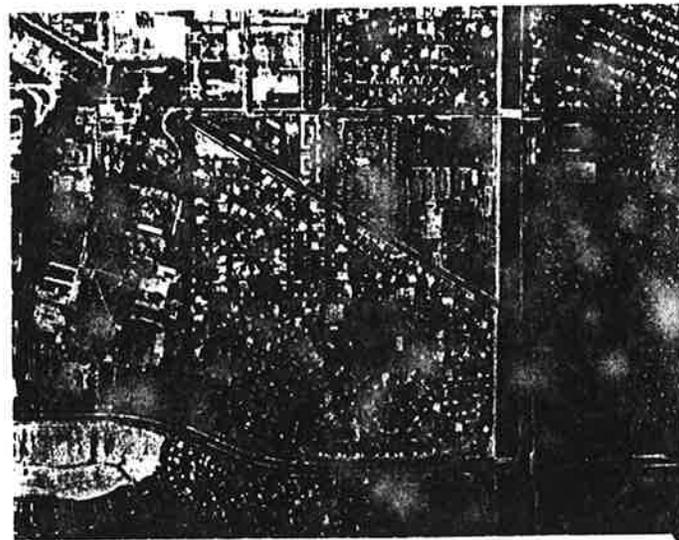
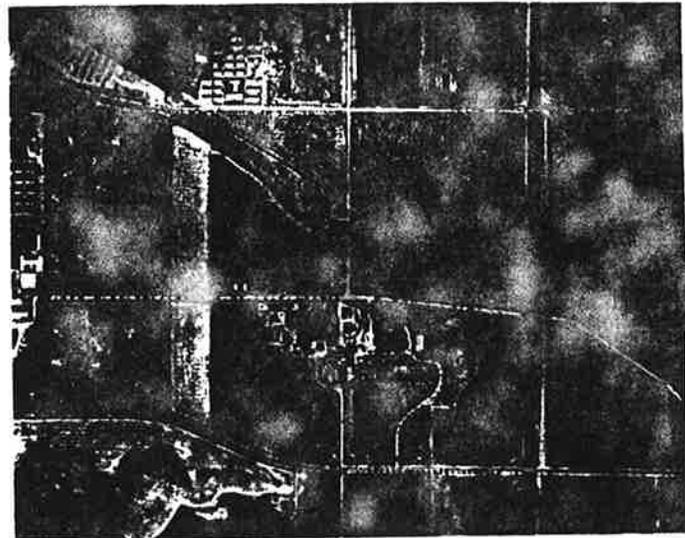
Treating living plant materials as a curatorial collection has also been undertaken at some cultural landscapes. This process, either done manually or by computer, can track the condition and maintenance operations on individual plants. Some sites, such as the Frederick Law Olmsted National Historic Site, in Brookline, Massachusetts have developed a field investigation numbering system to track all woody plants. (See Table, page 9) Due to concern for the preservation of genetic diversity and the need to replace significant plant materials, a number of properties are beginning to propagate historically important rare plants that are no longer commercially available, unique, or possess significant historic associations. Such herbarium collections become a part of a site's natural history collection.

Once the research and the documentation of existing conditions have been completed, a foundation is in place to analyze the landscape's continuity and change, determine its significance, assess its integrity, and place it within the historic context of similar landscapes.



Figures 14 and 15: Existing conditions plans for large corridor landscapes can employ a variety of documentation methodologies. For the 2-1/2 mile Rock Creek and Potomac Parkway, Washington, D.C., the Historic American Buildings Survey (HABS) used aerial photogrammetric photographs as the basis for digitized mapping and delineated drawings. Overall documentation was done at a scale of 1" = 40' with a 100' either side geographic context. Contours were shown at 2' intervals, tree canopy with trunk placement for specimen species, bridges (also drawn in detail), roads, and the creek itself. In all, there are 36 drawings measuring 34" x 44" for the project. These two sample drawings include the index to plans (above) and an area of existing conditions documentation (opposite top). (courtesy Historic American Buildings Survey)

Figures 16 and 17: Landscapes cannot be inventoried in a vacuum. Therefore, an understanding of its geographic context or setting should be part of inventory process. At Rancho Los Alamitos, Long Beach, California (middle and bottom opposite), a comparison between the 1936 aerial view with a present day aerial photograph illustrates the encroachments and adjacent developments that will affect the future treatment of visual and spatial relationships. (courtesy Rancho Los Alamitos Foundation)

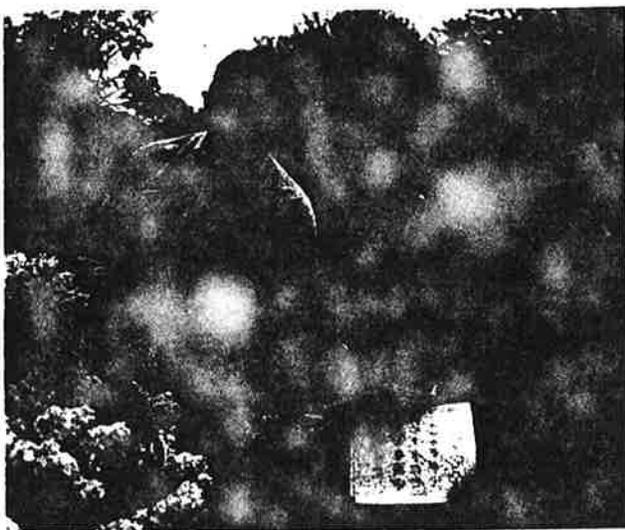


HISTORIC PLANT INVENTORY

Within cultural landscapes, plants may have historical or botanical significance. A plant may have been associated with a historic figure or event or be part of a notable landscape design. A plant may be an uncommon cultivar, exceptional in size, age, rare and commercially/unavailable. If such plants are lost, there would be a loss of historic integrity and biological diversity of the cultural landscape. To ensure that significant plants are preserved, an inventory of historic plants is being conducted at the North Atlantic Region of the National Park Service.³ Historical landscape architects work with landscape managers and historians to gather oral and documented history on the plant's origin and potential significance. Each plant is then examined in the field by an expert horticulturist who records its name, condition, age, size, distribution, and, any notable botanic characteristics.

Plants that are difficult to identify or are of potential historical significance are further examined in the laboratory by a plant taxonomist who compares leaf, fruit, and flower characteristics with herbarium specimens for named species, cultivars and varieties. For plants species with many cultivars, such as apples, roses, and grapes, specimens may be sent to specialists for identification.

If a plant cannot be identified, is dying or in decline, and unavailable from commercial nurseries, it may be propagated. Propagation ensures that when rare and significant plants decline, they can be replaced with genetically-identical plants. Cuttings are propagated and grown to replacement size in a North Atlantic Region Historic Plant Nursery.



1. The Arnold Arboretum's preservation technician, lilac specialist, and horticulturist compare lilacs from the Vanderbilt Mansion National Historic Site in Hyde Park, New York with lilac specimens in the Arboretum's living collection. (courtesy Olmsted Center)



3. The Arnold Arboretum's horticulturist, landscape historian, and preservation technician examine shrubs at the Longfellow National Historic Site in Cambridge, MA. (courtesy Olmsted Center)



2. The Arnold Arboretum's horticulturist and preservation technician examine an enormous black locust tree at the Home of F.D. Roosevelt National Historic Site in Hyde Park, NY. (courtesy Olmsted Center)

Site Analysis: Evaluating Integrity and Significance

By analyzing the landscape, its change over time can be understood. This may be accomplished by overlaying the various period plans with the existing conditions plan. Based on these findings, individual features may be attributed to the particular period when they were introduced, and the various periods when they were present.

It is during this step that the *historic significance* of the landscape component of a historic property and its integrity are determined. Historic significance is the recognized importance a property displays when it has been evaluated, including when it has been found to meet National Register Criteria.⁹ A landscape may have several areas of historical significance. An understanding of the landscape as a continuum through history is critical in assessing its cultural and historic value. In order for the landscape to have integrity, these character-defining features or qualities that contribute to its significance must be present.

While National Register nominations document the significance and integrity of historic properties, in general, they may not acknowledge the significance of the landscape's design or historic land uses, and may not contain an inventory of landscape features or characteristics. Additional research is often necessary to provide the detailed information about a landscape's evolution and significance useful in making decision for the treatment and maintenance of a historic landscape. Existing National Register forms may be amended to recognize additional areas of significance and to include more complete descriptions of historic properties that have significant land areas and landscape features.

Integrity is a property's historic identity evidenced by the survival of physical characteristics from the property's historic or prehistoric period. The seven qualities of integrity are location, setting, feeling, association, design, workmanship and materials.¹⁰ When evaluating these qualities, care should be taken to consider change itself. For example, when a second-generation woodland overtakes an open pasture in a battlefield landscape, or a woodland edge encloses a scenic vista. For situations such as these, the reversibility and/or compatibility of those features should be considered, both individually, and in the context of the overall landscape. Together, evaluations of significance and integrity, when combined with historic research, documentation of existing conditions, and analysis findings, influence later treatment and interpretation decisions. (See Figure 21-23)

Developing a Historic Preservation Approach and Treatment Plan

Treatment may be defined as work carried out to achieve a historic preservation goal—it cannot be considered in a vacuum. There are many practical and philosophical factors that may influence the selection of a treatment for a landscape. These include the relative historic value of the property, the level of historic documentation, existing physical conditions, its historic significance and integrity, historic and proposed use (e.g. educational, interpretive, passive, active public, institutional or private), long- and short-term objectives, operational and code requirements (e.g. accessibility, fire, security) and costs for anticipated capital improvement, staffing and maintenance. The value of any significant archeological and natural resources

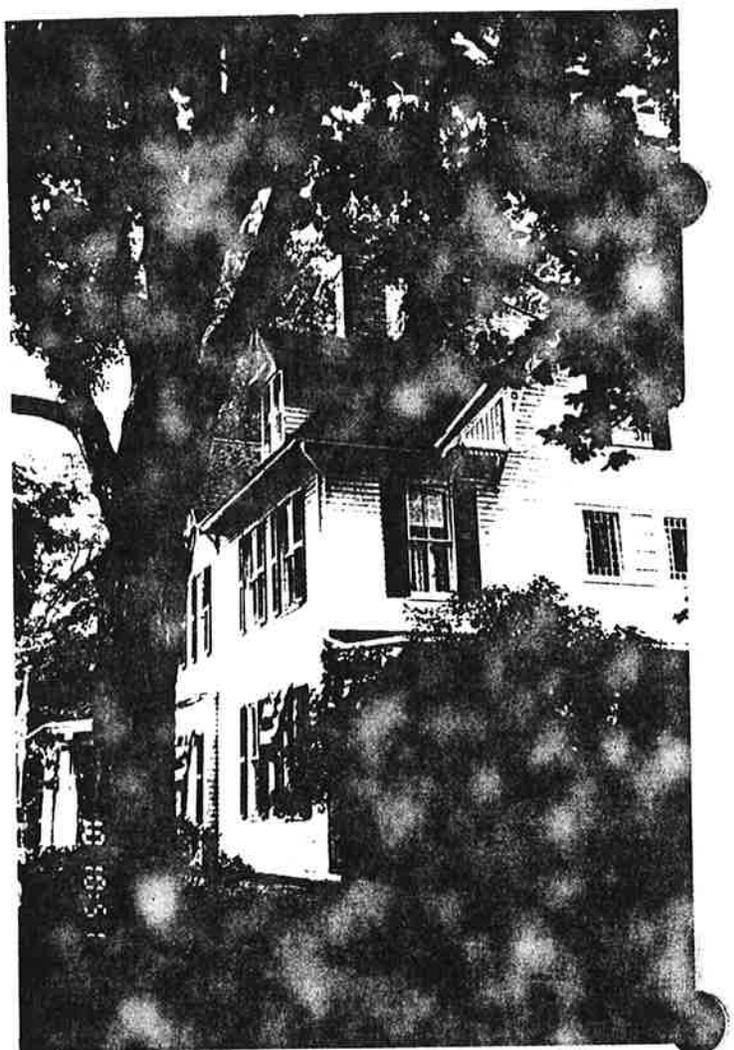


Figure 18: At Lawnfield, the home of President James A. Garfield near Cleveland, Ohio, the Sugar Maple that shadowed the porch during Garfield's 1880 "Front Porch Campaign" is in decline. Cuttings were taken from the historically significant tree by the Holden Arboretum and the National Park Service for eventual in-kind replacement. (courtesy NPS, Midwest Region)

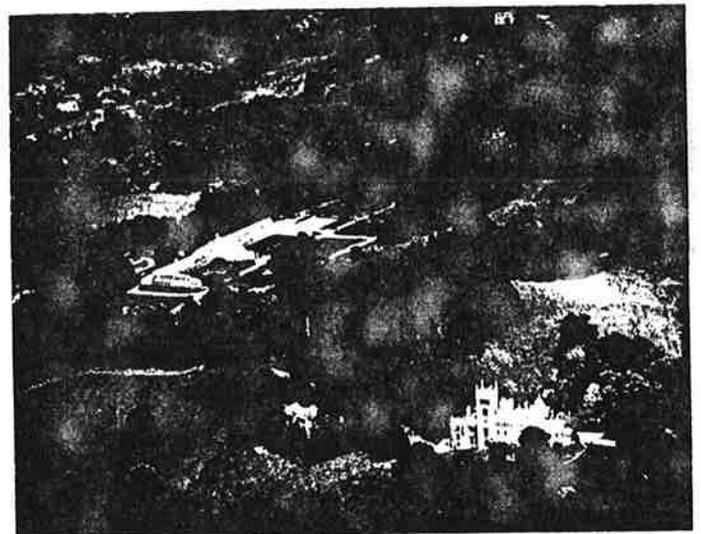


Figure 19: The landscape of Lyndhurst, Tarrytown, New York is significant in American culture and meets Criterion C of the National Register because it embodies the distinctive character of a type and period in American landscape architecture, known as early Picturesque; it possesses high artistic value; and it is the work of a recognized master gardener, Ferdinand Mangold. (courtesy National Trust for Historic Preservation)

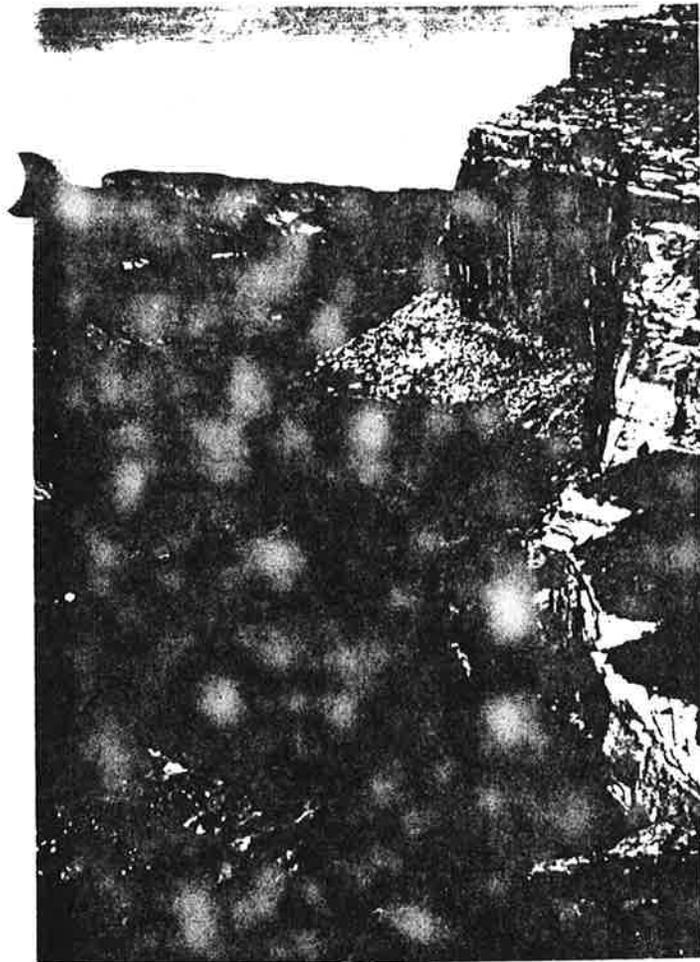
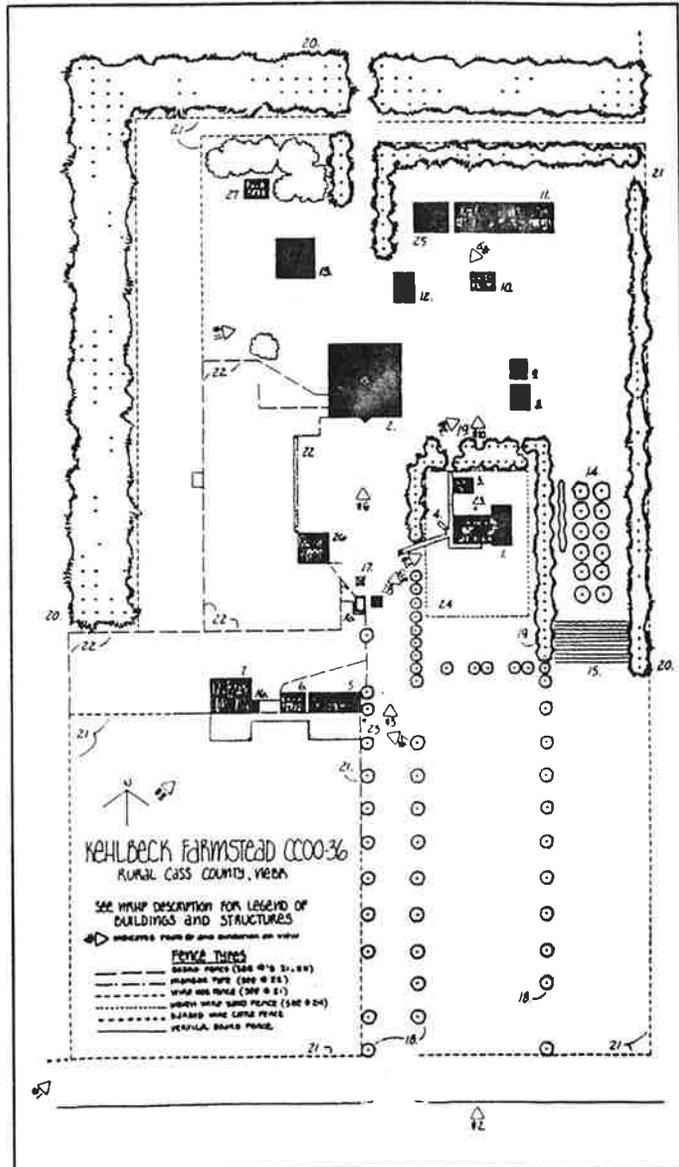


Figure 20: Cultural landscapes often contain plant communities such as orchards or meadows—both of which may or may not require a management intervention. When analyzing a landscape, it is important to recognize the present-day biodiversity of these resources—for example at the Fruita Rural Historic District in Capitol Reef National Park in Utah, the landscape contains 2,500 fruit trees associated with settlement and agriculture on the Colorado Plateau (courtesy D. White).

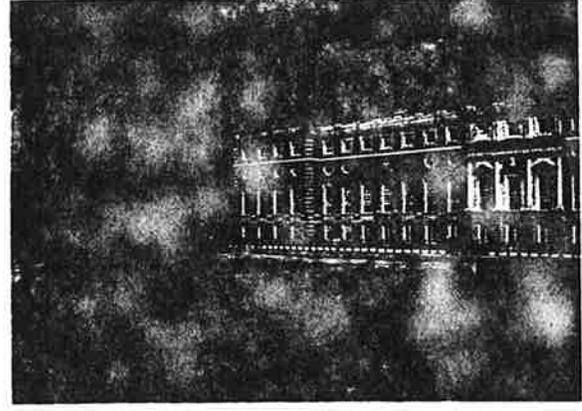
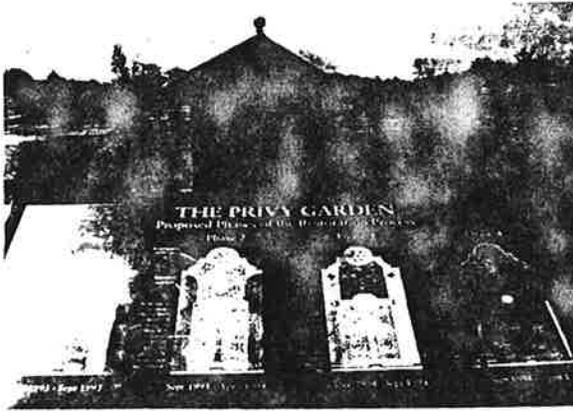


Figure 21: Integrity can involve both continuity and change. This can be evidenced by a detailed review of materials. Although the surface material has changed on some roads through the Port Oneida (near Empire, Michigan) community, the character-defining alignment, width and rows of Sugar Maple trees remain intact. (courtesy NPS, Midwest Region).



Figures 22 and 23: The plan for the Kehlbeck Farmstead, located in Cass County in Southeastern Nebraska, illustrates a well-planned, and aesthetically arranged general farm complex of the twentieth century. The farmstead is composed of 23 contributing and 5 non-contributing resources. Integrity was judged uniformly high because many character-defining resources were present and the visual and spatial relationships intact. Note the varied graphic techniques used to document a variety of landscape features and spatial relationships. The photograph above, labeled #3 on the farmstead, is looking north along the farm lane alley. (courtesy National Register Files)

LANDSCAPE INTERPRETATION



Figures A and B: Archeology and restoration of the Privy Garden at Hampton Court Palace gardens, England. The project is being interpreted to the public in the garden, an indoor exhibition and a multimedia show. The outdoor interpretive display, (above left) includes period plans, aerial photographs and historic images that detail the history of the garden and current work, 1994. (courtesy the author)

Landscape interpretation is the process of providing the visitor with tools to experience the landscape as it existed during its period of significance, or as it evolved to its present state. These tools may vary widely, from a focus on existing features to the addition of interpretive elements. These could include exhibits, self-guided brochures, or a new representation of a lost feature. The nature of the cultural landscape, especially its level of significance, integrity, and the type of visitation anticipated may frame the interpretive approach. Landscape interpretation may be closely linked to the integrity and condition of the landscape, and therefore, its ability to convey the historic character and character-

defining features of the past. If a landscape has high integrity, the interpretive approach may be to direct visitors to surviving historic features without introducing obtrusive interpretive devices such as free-standing signs. For landscapes with a diminished integrity, where limited or no fabric remains, the interpretive emphasis may be on using extant features and visual aids (e.g. markers, photographs, etc.) to help visitors visualize the resource as it existed in the past. The primary goal in these situations is to educate the visitor about the landscape's historic themes, associations and lost character-defining features or broader historical, social and physical landscape contexts.

should also be considered in the decision-making process. Therefore, a cultural landscape's preservation plan and the treatment selected will consider a broad array of dynamic and interrelated considerations. It will often take the form of a plan with detailed guidelines or specifications.

Adopting such a plan, in concert with a preservation maintenance plan (page 18-19), acknowledges a cultural landscape's ever-changing existence and the interrelationship of treatment and ongoing maintenance. Performance standards, scheduling and record keeping of maintenance activities on a day-to-day or month-to-month basis, may then be planned for. Treatment, management, and maintenance proposals can be developed by a broad range of professionals and with expertise in such fields as landscape preservation, horticulture, ecology, and landscape maintenance.

The selection of a primary treatment for the landscape, utilizing the Secretary of the Interior's Standards for the Treatment of Historic Properties, establishes an overall historic preservation approach, as well as a philosophical framework from which to operate. Selecting a treatment is based on many factors. They include management and interpretation objectives for the property as a whole, the period(s) of significance, integrity, and condition of individual landscape features.

For all treatments, the landscape's existing conditions and its ability to convey historic significance should be carefully considered. For example, the life work, design philosophy and extant legacy of an individual designer should all be understood for a designed landscape such as an estate, prior to treatment selection. For a vernacular landscape, such as a battlefield containing a largely intact mid-nineteenth century family farm, the uniqueness of that agrarian complex within a local, regional, state, and national context should be considered in selecting a treatment.

The overall historic preservation approach and treatment approach can ensure the proper retention, care, and repair of landscapes and their inherent features.¹¹ In short, the Standards act as a preservation and management tool for cultural landscapes. The four potential treatments are described in the box opposite.

Landscape treatments can range from simple, inexpensive preservation actions, to complex major restoration or reconstruction projects. The progressive framework is inverse in proportion to the retention of historic features and materials. Generally, preservation involves the least change, and is the most respectful of historic materials. It maintains the form and material of the existing landscape. Rehabilitation usually accommodates contemporary

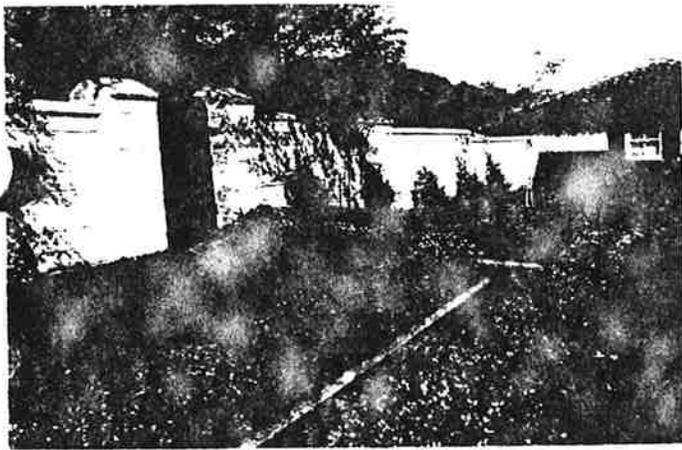


Figure 24: On some occasions, especially larger landscapes, it is possible to have a primary treatment, with discrete, or secondary areas of another treatment. This is most common for an individual feature in a larger landscape. At the Eugene and Carlotta O'Neill Historic Site, Danville, California the primary treatment selected for the courtyard was restoration. When accommodating universal accessibility requirements, the introduction of a grass paver walk was installed which warranted the removal of a few historic shrubs. This discrete project would be considered a rehabilitation treatment. (courtesy Patricia M. O'Donnell)



Figures 25 and 26: When the American Elm (*Ulmus americana*) was plagued with Dutch Elm Disease many historic properties relied on the Japanese Zelkova (*Zelkova serrata*) as a substitute plant. As illustrated, the overall form and scale of these trees is really quite different, and would therefore not be an appropriate substitute plant material under a restoration or reconstruction treatment.

TREATMENTS FOR CULTURAL LANDSCAPES

Prior to undertaking work on a landscape, a treatment plan or similar document should be developed. The four primary treatments identified in the Secretary of the Interior's

Preservation is defined as the act or process of applying measures necessary to sustain the existing form, integrity, and materials of an historic property. Work, including preliminary measures to protect and stabilize the property, generally focuses upon the ongoing maintenance and repair of historic materials and features rather than extensive replacement and new construction. New additions are not within the scope of this treatment; however, the limited and sensitive upgrading of mechanical, electrical and plumbing systems and other code-required work to make properties functional is appropriate within a preservation project.

Rehabilitation is defined as the act or process of making possible a compatible use for a property through repair, alterations, and additions while preserving those portions or features which convey its historical or cultural values.

Restoration is defined as the act or process of accurately depicting the form, features, and character of a property as it appeared at a particular period of time by means of the removal of features from other periods in its history and reconstruction of missing features from the restoration period. The limited and sensitive upgrading of mechanical, electrical and plumbing systems and other code-required work to make properties functional is appropriate within a restoration project.

Reconstruction is defined as the act or process of depicting, by means of new construction, the form, features, and detailing of a non-surviving site, landscape, building, structure, or object for the purpose of replicating its appearance at a specific period of time and in its historic location.

alterations or additions without altering significant historic features or materials, with successful projects involving minor to major change. Restoration or reconstruction attempts to recapture the appearance of a property, or an individual feature at a particular point in time, as confirmed by detailed historic documentation. These last two treatments most often require the greatest degree of intervention and thus, the highest level of documentation.

In all cases, treatment should be executed at the appropriate level reflecting the condition of the landscape, with repair work identifiable upon close inspection and/or indicated in supplemental interpretative information. When repairing or replacing a feature, every effort should be made to achieve visual and physical compatibility. Historic materials should be matched in design, scale, color and texture.

A landscape with a high level of integrity and authenticity may suggest preservation as the primary treatment. Such a treatment may emphasize protection, stabilization, cyclical maintenance, and repair of character-defining landscape features. Changes over time that are part of the landscape's continuum and are significant in their own right may be



Figure 27: The historic birch alley at Stan Hywet Hall, Akron, Ohio was suffering from borer infestation and leaf miner. Dying trees were topped and basal sprout growth encouraged. Next, trees were selectively thinned, and ultimately, when the new growth matured, older trunks were removed. Original rootstock and genetic material were preserved. As illustrated, this preservation treatment took fifteen years to realize. (courtesy Child Associates)

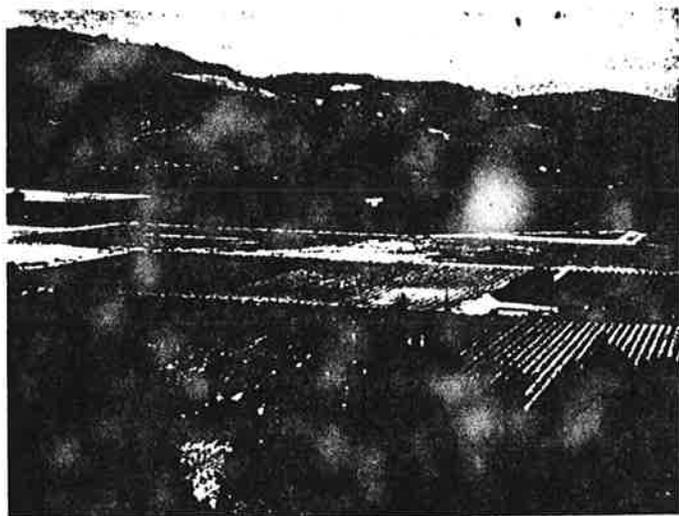


Figure 28: Patterns on the land have been preserved through the continuation of traditional uses such as the grape fields at the Sterling Vineyards in Calistoga, California. (courtesy author)



Figures 29: Rehabilitation was selected as the primary treatment for Columbus Park, Chicago, Illinois. Originally designed and executed between 1917 and 1920 by Jens Jensen, the waterfall, cascades, rocky brook and associated landscape, are well documented and possesses a high level of integrity. (courtesy author)

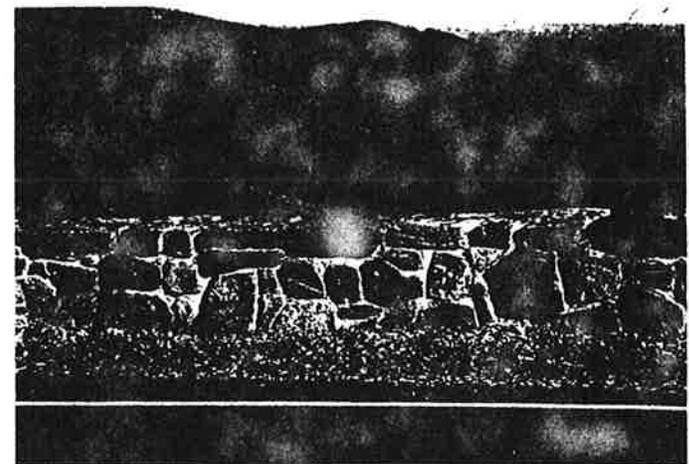
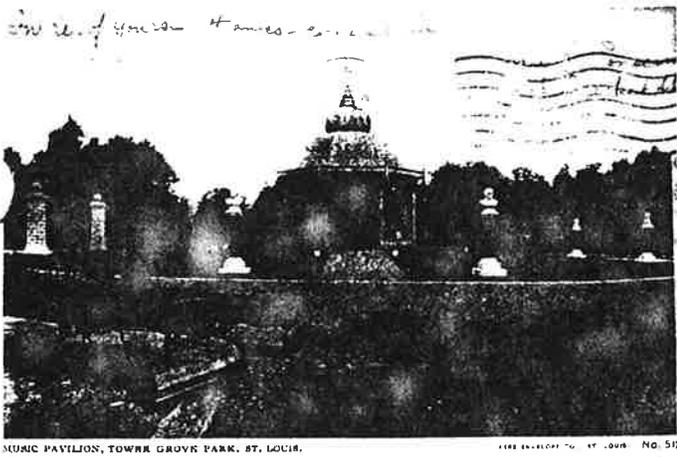


Figure 30, 31: A 75-mile portion of Skyline Drive at Shenandoah National Park overlooking the Blue Ridge Mountains of Virginia required the rehabilitation of a 22"-high, dry-laid stone wall. The new wall was built to a height of 27" - code normally requires a height of 36". The wall was constructed of precast concrete, clad with split stone and mortar joints. To achieve visual compatibility recessed mortar joints were arranged in a random pattern (courtesy Robert R. Page)



retained, while changes that are not significant, yet do not encroach upon or erode character may also be maintained. Preservation entails the essential operations to safeguard existing resources. (Figures 27-28)

Rehabilitation is often selected in response to a contemporary use or need—ideally such an approach is compatible with the landscape’s historic character and historic use. Rehabilitation may preserve existing fabric along with introducing some compatible changes, new additions and alterations. Rehabilitation may be desirable at a private residence in a historic district where the homeowner’s goal is to develop an appropriate landscape treatment for a front yard, or in a public park where a support area is needed for its maintenance operations. (Figures 29-31)

When the most important goal is to portray a landscape and its character-defining features at an exact period of time, restoration is selected as the primary treatment. Unlike preservation and rehabilitation, interpreting the landscape’s continuum or evolution is not the objective. Restoration may include the removal of features from other periods and/or the construction of missing or lost features and materials from the reconstruction period. In all cases, treatment should be substantiated by the historic research findings and existing conditions documentation. Restoration and reconstruction treatment work should avoid the creation of a landscape whose features did not exist historically. For example, if features from an earlier period did not co-exist with extant features from a later period that are being retained, their restoration would not be appropriate. (Figures 32-34)

In rare cases, when evidence is sufficient to avoid conjecture, and no other property exists that can adequately explain a certain period of history, reconstruction may be utilized to depict a vanished landscape. The accuracy of this work is critical. In cases where topography and the subsurface of soil have not been disturbed, research and existing conditions findings may be confirmed by thorough archeological investigations. Here too, those features that are intact should be repaired as necessary, retaining the original historic features to the greatest extent possible. The greatest danger in reconstruction is creating a false picture of history.

False historicism in every treatment should be avoided. This applies to individual features as well as the entire landscape. Examples of inappropriate work include the introduction of historic-looking benches that are actually a new design, a fanciful gazebo placed in what was once an open meadow, executing an unrealized historic design, or designing a historic-looking landscape for a relocated historic structure within “restoration.”



Figure 32-34: Tower Grove Park in St. Louis, Missouri, is a National Historic Landmark. The music pavilion, just north of the main drive is a circular lawn area with radiating walks, white marble busts of eminent composers, walks, and curb. The area was in general decline, especially the marble busts which were suffering from acid rain damage. Based on the excellent documentation in nineteenth century annual reports, postcards and photographic images, this area was recently restored. Illustrated above are a sample historic view, work in progress and the completed restoration project. (courtesy Tower Grove Park)

Developing a Preservation Maintenance Plan and Implementation Strategy

Throughout the preservation planning process, it is important to ensure that existing landscape features are retained. Preservation maintenance is the practice of monitoring and controlling change in the landscape to ensure that its historic integrity is not altered and features are not lost. This is particularly important during the research and long-term treatment planning process. To be effective, the maintenance program must have a guiding philosophy, approach or strategy; an understanding of preservation maintenance techniques; and a system for documenting changes in the landscape.

The philosophical approach to maintenance should coincide with the landscape's current stage in the preservation planning process. A Cultural Landscape Report and Treatment Plan can take several years to complete, yet during this time managers and property owners will likely need to address immediate issues related to the decline, wear, decay, or damage of landscape features. Therefore, initial maintenance operations may focus on the stabilization and protection of all landscape features to provide temporary, often emergency measures to prevent deterioration, failure, or loss, without altering the site's existing character.

After a Treatment Plan is implemented, the approach to preservation maintenance may be modified to reflect the objectives defined by this plan. The detailed specifications prepared in the Treatment Plan relating to the retention, repair, removal, or replacement of features in the landscape should guide and inform a comprehensive preservation maintenance program. This would include schedules for monitoring and routine maintenance, appropriate preservation maintenance procedures, as well as ongoing record keeping of work performed. For vegetation, the preservation maintenance program would also include thresholds for growth or change in character, appropriate pruning methods, propagation and replacement procedures.

To facilitate operations, a property may be divided into discrete management zones (Figure 41). These zones are sometimes defined during the Cultural Landscape Report process and are typically based on historically defined areas. Alternatively, zones created for maintenance practices and priorities could be used. Examples of maintenance zones would include woodlands, lawns, meadow, specimen trees, and hedges.

Training of maintenance staff in preservation maintenance skills is essential. Preservation maintenance practices differ from standard maintenance practices because of the focus on perpetuating the historic character or use of the landscape rather than beautification. For example, introducing new varieties of turf, roses or trees is likely to be inappropriate. Substantial earth moving (or movement of soil) may be inappropriate where there are potential archeological resources. An old hedge or shrub should be rejuvenated, or propagated, rather than removed and replaced. A mature specimen tree may require cabling and careful monitoring to ensure that it is not a threat to visitor safety. Through training programs and with the assistance of preservation maintenance specialists, each property could develop maintenance specifications for the care of landscape features

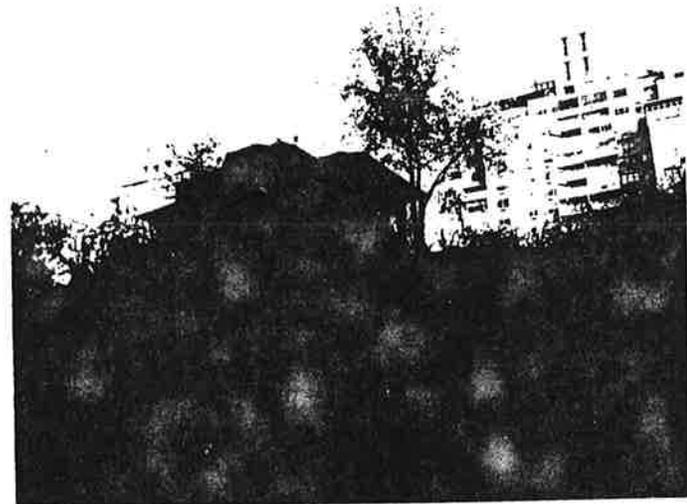
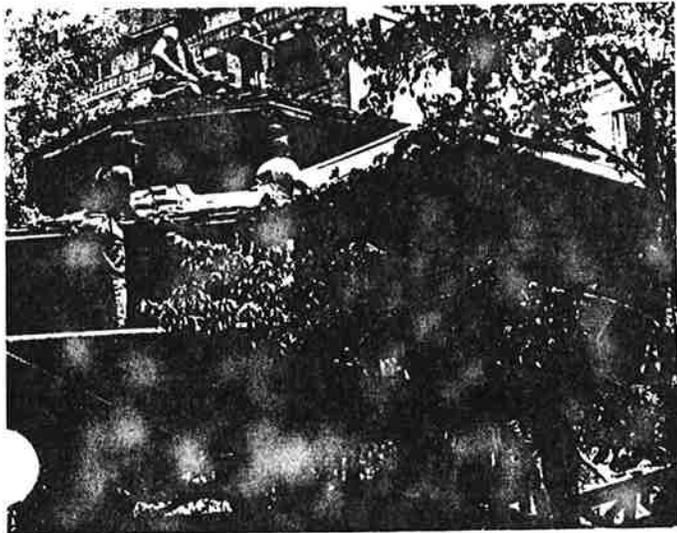
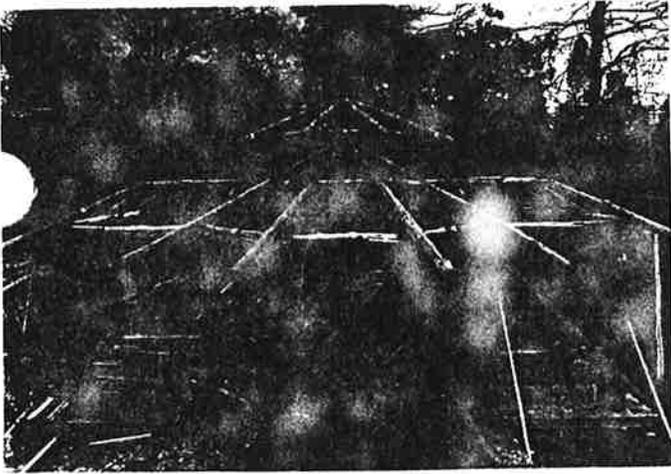


Figure 35-37: Central Park has developed an in-house historic preservation crew to undertake small projects. A specialized crew has been trained to specifically repair and rebuild rustic furnishings. As illustrated, the restoration of the Dene rustic shelter was achieved by constructing it in the Ramble compound, moving in-place opposite 67th Street and completed. (courtesy Central Park Conservancy)

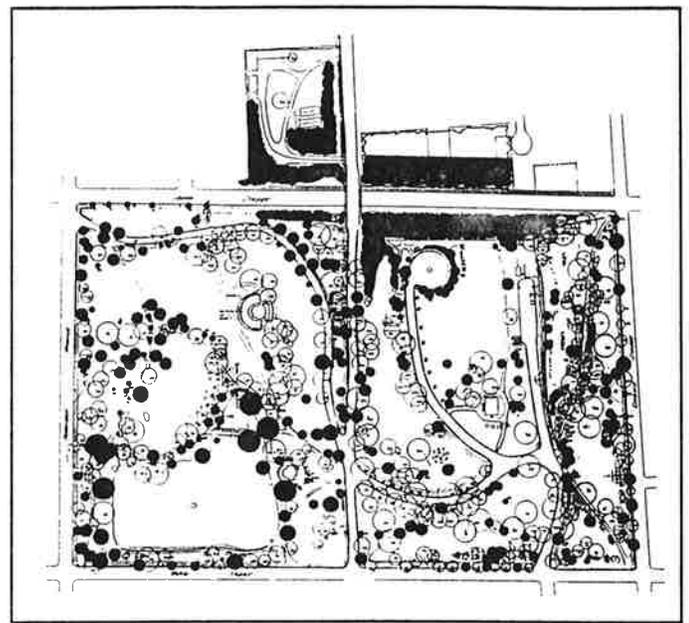
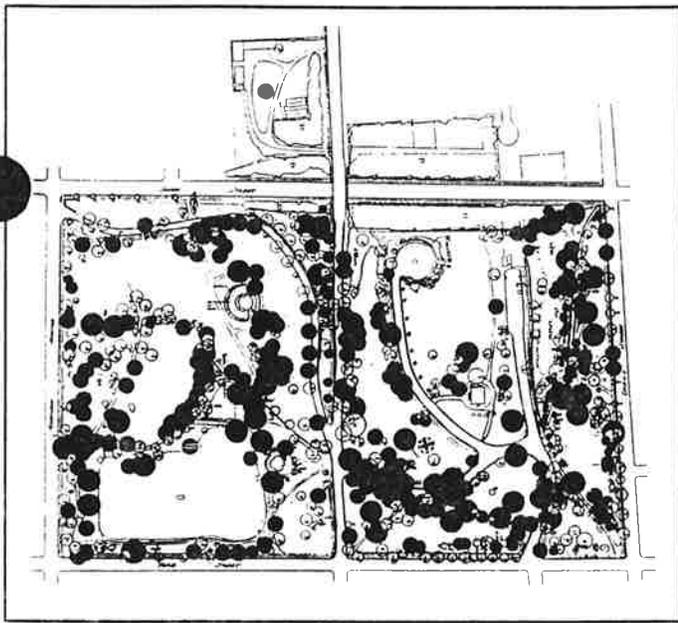


Figure 38 and 39 (above, left and right): The importance of landscape analysis and its ability to inform treatment and maintenance decisions is reflected in these two plans for Downing Park, Newburgh, New York. The plan, rendered in black, top left, illustrates all extant historic plants, while the plan, top right, depicts plantings which are non-historic or invasive for removal or relocation outside of the historic park. (courtesy LANDSCAPES)



Figure 40: A management decision was made to place a fence around a sentinel tree in Balboa Park, San Diego, California. The fence protects the specimen from root damage—impact from excessive pedestrian compaction or lawn mower damage. (courtesy author).

Figure 41 (below): A small property of under an acre may only have a few management zones including lawn, trees over lawn, shrub and herbaceous borders. Larger, more complex landscapes such as Jamaica Pond Park, Boston and Brookline, Massachusetts, contains a broader range of management zones including: forests, trees over grass—broad areas, trees over grass—narrow areas, meadows, and mown grass for active recreation amenities or passive use. (courtesy Walmsley/Pressley Joint Venture)



DEVELOPING A PRESERVATION MAINTENANCE GUIDE

In the past, there was rarely adequate record-keeping to fully understand the ways a landscape was maintained. This creates gaps in our research findings. Today, we recognize that planning for ongoing maintenance and on-site applications should be documented—both routinely and comprehensively. An annual work program or calendar records the frequency of maintenance work on built or natural landscape features. It can also monitor the age, health and vigor of vegetation. For example, on-site assessments may document the presence of weeds, pests, dead leaves, pale color, wilting, soil compaction—all of which signal particular maintenance needs. For built elements, the deterioration of paving or drainage systems may be noted and the need for repair or replacement indicated before hazards develop. An overall maintenance program can assist in routine and cyclic maintenance of the landscape and can also guide long term treatment projects.

To help structure a comprehensive maintenance operation that is responsive to staff, budget, and maintenance priorities, the National Park Service has developed two computer-driven programs for its own landscape resources. A Maintenance Management Program (MM) is designed to assist maintenance managers in their efforts to plan, organize, and direct the park maintenance system. An Inventory and Condition Assessment Program (ICAP) is designed to complement

MM by providing a system for inventorying, assessing conditions, and for providing corrective work recommendations for all site features.

Another approach to documenting maintenance and recording changes over time is to develop a manual or computerized graphic information system. Such a system should have the capability to include plans and photographs that would record a site's living collection of plant materials. (Also see discussion of the use of photography under Preparing Existing Conditions Plans, page 5.) This may be achieved using a computer-aided drafting program along with an integrated database management system.

To guide immediate and ongoing maintenance, a systematic and flexible approach has been developed by the Olmsted Center for Landscape Preservation. Working with National Park Service landscape managers and maintenance specialists, staff assemble information and make recommendations for the care of individual landscape features.

Each landscape feature is inspected in the field to document existing conditions and identify field work needed. Recommendations include maintenance procedures that are sensitive to the integrity of the landscape.

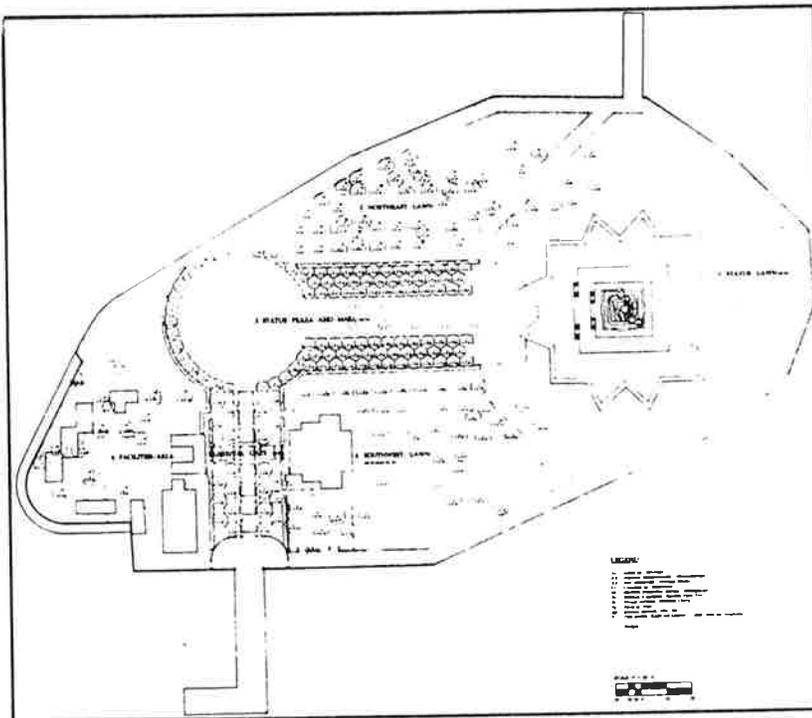


Figure A- Existing Conditions: A map of the existing trees at the Statue of Liberty National Monument is used to indicate necessary preservation maintenance work (Drawn by Margaret Coffin, 1992)

Statue of Liberty National Monument											
FIELD INVENTORY, INSPECTION, AND WORK NEEDED											
Category	Species	Tree	Height	DBH	Condition	Work Needed	Priority	Notes	Inspector	Date	Location
London Plane Tree	4-0-26	2	2	2	2	2	2	2	2	2	2
London Plane Tree	4-0-27	1	2	2	2	2	2	2	2	2	2
London Plane Tree	4-0-28	1	3	3	3	3	3	3	3	3	3
London Plane Tree	4-0-29	2	2	2	2	2	2	2	2	2	2
London Plane Tree	4-0-30	2	2	2	2	2	2	2	2	2	2
London Plane Tree	4-0-31	2	3	3	3	3	3	3	3	3	3
London Plane Tree	4-0-32	3	2	2	2	2	2	2	2	2	2
London Plane Tree	4-0-33	3	2	2	2	2	2	2	2	2	2
London Plane Tree	4-0-34	1	2	2	2	2	2	2	2	2	2
London Plane Tree	4-0-35	2	2	2	2	2	2	2	2	2	2
London Plane Tree	4-0-36	3	3	3	3	3	3	3	3	3	3

Figure B - Field Inventory, Inspection, and work needed: Within areas of the landscape, each feature is assigned a field identification number. An inspection is conducted to assess the condition, potential problems, such as deadwood or integral decay, and specify work needed. A map (above) is used to locate features that require attention

Statue of Liberty National Monument FEATURE DATA - LONDON PLANE TREE	
CATEGORY:	Deciduous Tree
AREAS:	4. South Lawn
FEATURE NAME:	London Plane tree (<i>Platanus acerifolia</i>)
SOURCE OF IDENTIFICATION:	Al Farnugio, STU Horticulture, 1992
DESCRIPTIVE CHARACTERISTICS: The fruit of London Plane Tree is typically in clusters of 2, leaves are large, 5-10" width whereas the fruit of American Sycamore is singular, and leaves are slightly smaller	
HISTORIC SIGNIFICANCE/ APPEARANCE/ INTENT: London Plane trees were specified in the General Development Plan by Norman Newton in 1937 (Newton, N. T. Design on the Land, Harvard University Press, 1971, p. 54)	
PRESERVATION PRACTICES AND WORK PROCEDURES:	
Winter - Prune out dead, damaged wood and waterprouts as needed. Inspect for interior decay and pest damage. Thinnest tools between cuts to prevent spread of cankerstem disease.	
Spring - Trunk protection. Take preventative actions to protect the base of each tree from string trimmer damage. Train all equipment operators.	
Monitor and treat anthracnose. Prolonged periods of cool, moist, damp spring weather will increase anthracnose. The best times to control anthracnose are before bud break, at bud break, and when leaves have expanded.	
LINDENS - Prune out crossing branches on young trees.	
LAWN - Rake lawn areas in the early spring to remove matted grass and accumulated debris. Dislurch lawn areas where thatch accumulation exceeds 3/4 of an inch. Aerate with AERIE aerator. Lawn areas that are heavily compacted. However do not aerate around the trees because of shallow roots.	
Leaf pruning and trimming operations. Instruct all equipment operators on how to prevent damage to tree trunks.	
Check soil pH. Send soil samples to Cooperative Extension Service for analysis of pH, phosphorus and potassium levels. Apply lime and fertilizer as necessary to adjust the soil condition.	
Fertilize in late May or early June with an organic fertilizer with an analysis of 5-4-3 or equivalent. Apply at a rate of one pound of nitrogen per 1000 square feet. This is the limit of three annual applications.	
Inspect lawn areas for pests (grubs) and disease (leaf spot, leaf smut) damage.	
RECOMMENDED METHOD AND SOURCE OF REPLACEMENT: Replace in-kind with nursery stock. Consider anthracnose resistant cultivars that are similar in size and character to the straight species.	
PROPAGATION METHOD: Take root cuttings in July or August. Treat with IBA.	
ADDITIONAL SOURCES OF INFORMATION: Shigo, Alex L. A New Tree Bookery. Durham NH. Shigo & Trees, Assoc., 1986. Sincilar, Lynn & Johnson. Diseases of Trees & Shrubs. Ithaca NY. Cornell U. Press, 1987.	

Figure C - Feature Data: For each feature that requires special care, a detailed sheet is developed. This contains notes on when to monitor and carry out work, specific procedures, cite potential problems, and perform repair or replacement.

Statue of Liberty National Monument CALENDAR - SPRING	
FOR ALL TREES -	
Transplant. Spring is the best time to transplant trees.	
If soil or leaf analysis indicates that fertilizer is needed, late fall is the best time to fertilize trees. However, fertilizer may also be applied in early Spring, before bud break. Use an organic fertilizer with the micronutrients needed, such as manganese. If the lawn area below the trees is receiving fertilizer, additional fertilizer is not necessary. Light annual pruning throughout the tree tends to reduce the amount of fertilizer needed.	
LONDON PLANE TREES -	
Trunk protection. Take preventative actions to protect the base of each tree from string trimmer damage. Train all equipment operators.	
Monitor and treat anthracnose. Prolonged periods of cool, moist, damp spring weather will increase anthracnose. The best times to control anthracnose are before bud break, at bud break, and when leaves have expanded.	
LINDENS - Prune out crossing branches on young trees.	
LAWN - Rake lawn areas in the early spring to remove matted grass and accumulated debris. Dislurch lawn areas where thatch accumulation exceeds 3/4 of an inch. Aerate with AERIE aerator. Lawn areas that are heavily compacted. However do not aerate around the trees because of shallow roots.	
Leaf pruning and trimming operations. Instruct all equipment operators on how to prevent damage to tree trunks.	
Check soil pH. Send soil samples to Cooperative Extension Service for analysis of pH, phosphorus and potassium levels. Apply lime and fertilizer as necessary to adjust the soil condition.	
Fertilize in late May or early June with an organic fertilizer with an analysis of 5-4-3 or equivalent. Apply at a rate of one pound of nitrogen per 1000 square feet. This is the limit of three annual applications.	
Inspect lawn areas for pests (grubs) and disease (leaf spot, leaf smut) damage.	

Figure D - Calendar for Monitoring and for Work: All feature-specific monitoring and work recommendations are combined into one seasonal calendar for all areas of the landscape to ensure that important work activities are not overlooked.

Statue of Liberty National Monument RECORD KEEPING - FEATURE: LONDON PLANE TREE		
Marked when on measurements, conditions, work performed, reason for removal, replacement or material, propagation method and growing material, source of feature, or reference to a related report, etc.		
All deadwood and waterprouts removed by Arboriculture class from University of Massachusetts.	X	AF 9/92
Replaced tree # 4-0-26 with London Plane Tree, anthracnose-resistant cultivar 'Columbia' installed through Gardener In-Task Project.	X	AF 4/93
# 4-0-26 damaged by vandalism, X re-cut and restaked.		AF 5/93
Removed and replaced # 4-0-37 with London Plane Tree, anthracnose resistant cultivar 'Liberty' in order to compare with 'Columbia'.	X	AF 5/93
# 4-0-26 'Columbia' and # 4-0-37 'Liberty' both in fairly good condition. Both received water by gallon bag 1" a week during July and August.	X	AF 8/93

Figure E - Record Keeping: A record sheet is created for each type of feature. Maintenance staff may record information relating to changes in condition, major work performed, removal, replacement, propagation and any other events. As records are added too through the years, they become a valuable source of documentation of the landscape's history.

Because landscapes change through the seasons, specifications for ongoing preservation maintenance should be organized in a calendar format. During each season or month, the calendar is referenced to determine when, where, and how preservation maintenance is needed. For example, for some trees structural pruning is best done in the late winter while other trees are best pruned in the late summer. Serious pests are monitored at specific times of the year, in certain stages of their life cycle. This detailed calendar will in turn identify staff needs and work priorities.

Depending on the level of sophistication desired, one approach to documenting maintenance data and recording change over time is to use a computerized geographical or visual information system.¹³ Such a system would have the capability to include plans and photographs that would focus on a site's landscape features.

If a computer is not available, a manual or notebook can be developed to organize and store important information. This approach allows managers to start at any level of detail and to begin to collect and organize information about landscape features (see Box opposite and above). The value of these maintenance records cannot be overstated. These records will be used in the future by historians to understand how the landscape has evolved with the ongoing care of the maintenance staff.

Recording Treatment Work and Future Research Recommendations

The last and ongoing step in the preservation planning process records the treatment work as carried out. It may include a series of as-built drawings, supporting photographic materials, specifications and a summary assessment. New technologies that have been successfully used should be

highlighted. Ideally, this information should be shared with interested national organizations for further dissemination and evaluation.

The need for further research or additional activities should also be documented. This may include site-specific or contextual historical research, archeological investigations, pollen analysis, search for rare or unusual plant materials, or, material testing for future applications.

Finally, in consultation with a conservator or archivist—to maximize the benefit of project work and to minimize the potential of data loss—all primary documents should be organized and preserved as archival materials. This may include field notes, maps, drawings, photographs, material samples, oral histories and other relative information.

Summary

The planning, treatment, and maintenance of cultural landscapes requires a multi-disciplinary approach. In landscapes, such as parks and playgrounds, battlefields, cemeteries, village greens, and agricultural land preserves—more than any other type of historic resource—communities rightly presume a sense of stewardship. It is often this grass roots commitment that has been a catalyst for current research and planning initiatives. Individual residential properties often do not require the same level of public outreach, yet a systematic planning process will assist in making educated treatment, management and maintenance decisions.

Wise stewardship protects the character, and or spirit of a place by recognizing history as change over time. Often, this also involves our own respectful changes through treatment. The potential benefits from the preservation of cultural landscapes are enormous. Landscapes provide

scenic, economic, ecological, social, recreational and educational opportunities that help us understand ourselves as individuals, communities and as a nation. Their ongoing preservation can yield an improved quality of life for all, and, above all, a sense of place or identity for future generations.

Selected Reading

Birnbaum, Charles A, guest editor. *Preservation Forum*. "Focus on Landscape Preservation". Washington, D.C.: National Trust for Historic Preservation, Volume 7, No. 3, May/June 1992.

Buggey Susan, guest editor. *APT Bulletin. Special Issue: Conserving Historic Landscapes*. Fredericksburg, VA: Association for Preservation Technology International, Volume XXIV, No. 3-4, 1992.

Burns, John A, and the Staff of HABS/HAER. *Recording Historic Structures*. American Institute of Architects Press, 1989. (Includes chapter on the documentation of Meridian Hill Park, pp. 206-219.)

Diehl, Janet and Thomas S. Barrett, et al. *The Conservation Easement Handbook. Managing Land Conservation and Historic Preservation Easement Programs*, The Land Trust Exchange (now Alliance) and the Trust for Public Land, 1988.

International Committee of Historic Gardens and Sites, ICOMOS-IFLA. *Jardins et Sites Historiques*, Scientific Journal. ICOMOS 1993. Compilation of papers on the subject, in both english and french.

Kelso, William M., and Rachel Most. *Earth Patterns: Essays in Landscape Archaeology*. Charlottesville, VA: University Press of Virginia, 1990.

Stokes, Samuel, N., et al. *Saving America's Countryside: A Guide to Rural Conservation*. Baltimore and London: John Hopkins University Press, 1989.

Tishler, William, editor. *American Landscape Architecture, Designers and Places*. Washington, DC: The Preservation Press, 1989.

Several publications available from the National Park Service deal directly with the preservation of historic landscapes. These include:

America's Landscape Legacy, Brochure, Preservation Assistance Division, 1992.

Guidelines for the Treatment of Historic Landscapes, Preservation Assistance Division, 1992 (Draft).

Case Studies in Landscape Preservation, Preservation Assistance Division in cooperation with the Alliance for Landscape Preservation, 1995.

Cultural Landscapes Bibliography: An Annotated Bibliography of Resources in the National Park System, Park Historic Architecture Division, 1992.

Historic Landscape Directory: A Source Book of Agencies, Organizations, and Institutions Providing Information on Historic Landscape Preservation, Preservation Assistance Division, 1991.

CRM, Cultural Resource Management, Thematic Issues: *The Preservation of Cultural Landscapes*, Volume 14, No.6,

1991; *A Reality Check for Our Nation's Parks*, Volume 16, No. 4, 1993; *Historic Transportation Corridors*, Volume 16, No. 11, 1993; and, *The Interpretation of Cultural Landscapes*, Volume 17, No. 8, 1994.

Pioneers of American Landscape Design: An Annotated Bibliography, Preservation Assistance Division, 1993 (ISBN:0-16-041974-3).

Making Educated Decisions: A Landscape Preservation Bibliography, Preservation Assistance Division, 1994 (ISBN:0-16-045145-0)

National Register Bulletin 18: How to Evaluate and Nominate Designed Historic Landscapes; National Register Bulletin 30: Guidelines for Evaluating and Documenting Rural Historic Landscapes; National Register Bulletin 40: Guidelines for Evaluating and Registering Battlefields; and, National Register Bulletin 41: Guidelines for Evaluating and Registering Cemeteries, Interagency Resources Division.

Endnotes

¹ The cultural landscape definitions are contained in *NPS-28, Cultural Resource Management Guideline*, Release No. 4, 1994, National Park Service.

² For an expanded list of offices to contact, see *America's Landscape Legacy* brochure. Free from the National Park Service Preservation Assistance Division.

³ From Kelso, William. *A Report on the Archaeological Excavation at Monticello, Charlottesville, VA, 1979-1981*, Thomas Jefferson Memorial Foundation, 1982.

⁴ Lewis, Pierce, "Common Landscapes as Historic Documents," Lubar, Steven and Kingery, W. David (eds.), *Essays on Material Culture*, Smithsonian Institution Press, Washington, DC, 1993, p. 138.

⁵ Meinig, D. W. "The Beholding Eye: Ten Versions of the Same Scene," *The Interpretation of Ordinary Landscapes*, Oxford University Press, New York, 1979, pp. 33-48.

⁶ See National Park Service *National Register Bulletins* under Selected Reading (opposite).

⁷ The Historic American Buildings Survey, HABS, has generated standards for landscape documentation that they now utilize on a number of projects. Specifically, a case study on recording historic landscapes is included in *Recording Historic Structures*, pp. 206-219. See Selected Reading (opposite).

⁸ This is being undertaken with technical assistance from the Olmsted Center for Landscape Preservation a partnership between the National Park Service and the Arnold Arboretum of Harvard University that provides cultural landscape technical assistance, technology development and training.

⁹ See *National Register Bulletin 16A: How to Complete the National Register Registration Form*. Washington, D.C.: U.S. Department of the Interior, National Park Service, Interagency Resources Division, 1991.

¹⁰ *Ibid.*

¹¹ The standards are general principles for the treatment of buildings, structures, sites, objects, districts and landscapes. The treatment standards are one set of standards included in the broader group known as the *Secretary of the Interior's Standards for Archaeology and Historic Preservation*.

¹² The Secretary of the Interior is responsible for establishing professional standards and providing advice on the preservation and protection of all cultural resources listed on or eligible for the National Register of Historic Places. For a copy of the brochure, *The Secretary of the Interior's Standards for the Treatment of Historic Properties*, 1992 contact the National Park Service Preservation Assistance Division (424) Box 37127 Washington, DC 20013-7127.

¹³ A visual information system, a computer-aided mapping program with a linked database, has been developed for the historic landscape at the Frederick Olmsted National Historic Site. Data can be accessed directly from a digitized map such as information on each plant including identification, age, location, size, condition, and maintenance history.

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September 1994

Principles for Preserving Historic Plant Material

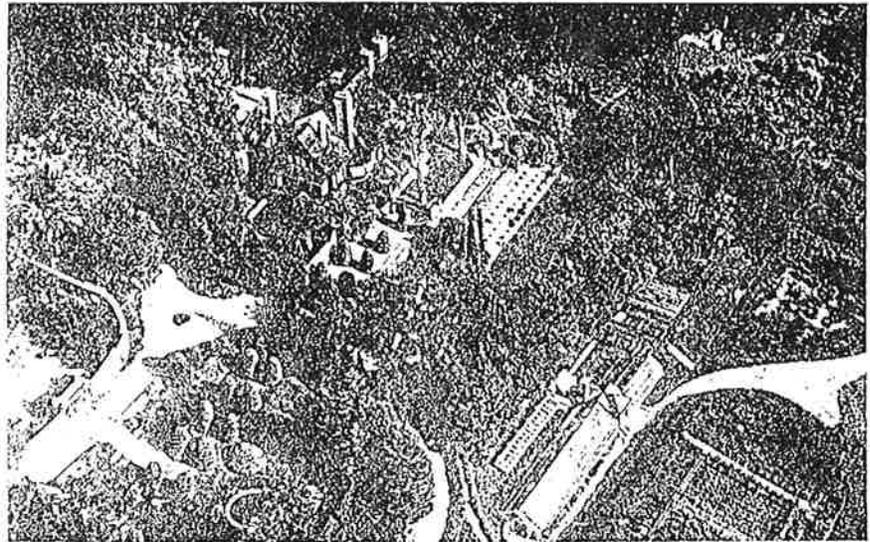
Lauren Meier and Nora Mitchell

Historic landscapes are composed of a variety of features which define their historic character. The elements of landscapes include large-scale characteristics such as spatial relationships and views as well as individual features including topography, vegetation, water features, roads and paths, structures, site furnishings, and objects. Although certain landscapes are very architectural, the principal component which distinguishes landscapes from other types of cultural resources is vegetation. The use of plants in the landscape reflects social, cultural and economic history just as clearly as structures or any other feature. The fact that vegetation grows, changes, and eventually dies does not alter the fact that it is part of the historic record. Recognizing that vegetation is part of the historic fabric of landscapes, does, however, have a number of implications for preservation of this type of cultural resource.

This article addresses the vegetation of landscapes that have historic value, in particular, designed and rural vernacular landscapes (as defined in NPS-28: *Cultural Resource Management Guidelines*). It does not address ethnographic landscapes specifically, although some of the information presented here may be relevant. The intent of this article is to begin to draw some general principles and give examples of good practice in the treatment of historic vegetation. Also included are some preliminary ideas being developed for the *Guidelines for the Treatment of Historic Landscapes* which will interpret the *Secretary of the Interior's Standards for Historic Preservation Projects* for landscapes.

The Importance of Historic Vegetation

The cultivation, propagation, and artistic use of plants is an important



Vegetation is the principal material of historic landscapes and contributes significantly to a property's historic character as illustrated at Naumkeag in Stockbridge, MA, designed by Fletcher Steele. Photo courtesy National Register of Historic Places.

part of American history. Prior to European settlement, indigenous plants were used extensively by Native Americans for food as well as for building materials, and for dye or ceremonial functions. Later, the cultivation of plants for subsistence farming grew into an American gardening tradition and the use of plants for purely aesthetic purposes. Colonial gardens borrowed both form and plant materials from their European roots, developing extensively in the 18th century English colonies.

Thomas Jefferson wrote "the greatest service which can be rendered any country is to add a useful plant to its culture." The exchange of plants began very early in the history of North America. Native Americans had access to plants from Peru to Mexico and from as far away as Africa from Spanish traders. Before Columbus came to the New World, South American food plants had been carried north and east as far as Canada and New England. After European settlement, the plant ex-

change between the English colonies and the New World thrived. Settlers brought plants as they journeyed to the colonies. Similarly, many plant explorers came to the New World to collect specimens. In the 19th and 20th centuries, accomplishments in plant cultivation, hybridization, and distribution along with additional plant exchange have continued to contribute to the diversity of plant species found in American landscapes. As a result, cultural landscapes found today contain a vast array of horticultural variety, including plants used for functional and aesthetic purposes.

Both native and introduced plants are part of our material culture. Even though often considered a natural resource, vegetation features may be significant cultural resources as well. For example, areas of natural vegetation, such as woodlots and wetlands, may also be present in historic landscapes. Without these character-defining features, much of the historic fabric and visual qualities of the property may be lost. It is

(continued on page 18)

Principles for Preserving Historic Plant Material
(continued from page 17)

therefore essential to include proper treatment of historic vegetation in any preservation effort.

Evaluating Vegetation Features

Inventory and documentation, as well as analysis of existing conditions and overall integrity of the property, should precede any treatment work in a historic landscape. It is important to evaluate the landscape as a whole, as well as its individual components. Vegetation features may include solitary plants which function as specimens in the landscape, as well as aggregations of plants such as hedges, hedgerows, allees, ornamental plantings, perennial borders, orchards, fields, and lawns. In some landscapes, naturally-occurring vegetation may have acquired historic significance due to its association with a significant event, practice, or person. The treatment of these individual vegetation features must be consistent with the overall objectives for the property as a whole.



Preservation maintenance is essential to maintaining the health and appropriate appearance of character-defining vegetation. Removing the dead and dying limbs and branches of the historic "Olmsted" Elm helps to eliminate the infection zones of Dutch Elm disease. Photo by Charles Pepper, courtesy the Frederick Law Olmsted National Historic Site.

A variety of sources and techniques may be used to assemble adequate information on the historic vegetation of a site. Primary sources including personal diaries or journals, agricultural records, historic photos, paintings, etchings, and oral histories may all provide information about the historic appearance, care, or use of the vegetation. In some cases, as with designed historic landscapes, planting plans may also be available. However, in many instances, very little information on historic vegetation may be forthcoming. As a result, secondary sources such as historic horticultural texts may provide an indication of the type of vegetation used during the period of significance.

Through the process of assembling documentary data and field survey information, the historic vegetation location, use, appearance, and changes should be substantiated to the greatest extent possible. The existing vegetation should be inventoried and evaluated, including extant historic features as well as more recent additions and invasive plant material. The condition of the features should be determined as part of the field survey in order to assess their overall health and any specific treatment or needs. It is also important to consider the dynamic qualities of vegetation and understand how much of this inevitable change contributes to, or compromises, the historic character of the property. Finally, the existing appearance of the vegetation should be analyzed in relation to the historic documentation. The feature's condition, relationship to historic vegetation, and overall management objectives for the property will help guide the selection of an appropriate preservation treatment.

Preservation Treatments

Preservation projects involve one of the following treatments: protection, stabilization, preservation, rehabilitation, restoration, and reconstruction. While these terms were initially developed to describe work undertaken on historic buildings, all relate to vegetation as well. Due to the nature of vegetation, these terms may represent very different types of work than is associ-

ated with historic buildings. The most common treatments for vegetation are protection, preservation, and restoration. These treatments are discussed below.

Protection projects generally involve measures necessary to guard against further deterioration or damage. For vegetation, this may involve actions necessary to protect the plant itself, or actions against plants which are themselves causing damage. In the latter case, it is important to distinguish between historically significant vegetation and that which is simply invasive or intrusive.

Historically significant vegetation that causes damage to or threatens historic structures should be controlled, rather than removed whenever possible, since the plants are part of the historic fabric of the property. This might involve temporarily removing the specimen, while undertaking treatment on the structure, or pruning the original material back to eliminate the problem. At the Olmsted National Historic Site, the original *Wisteria* and *Actinidia* vines which historically covered the clapboard facade of the house were pruned back during the building's restoration. Now, the park's horticulturist is experimenting with a variety of trellis systems that will allow the building and vegetation to coexist, thus protecting both important features of the property.

In rural landscapes, fencing or other types of enclosures may be necessary to protect historic vegetation from damage from livestock or game, or from overuse by visitors. In southern orchards, smudge pots are often used to protect the trees from early frost damage. In northern climates, many historic plants require protective measures such as winter mulching, wrapping, staking, or other methods to protect them from snow, wind, or damage from severe freeze.

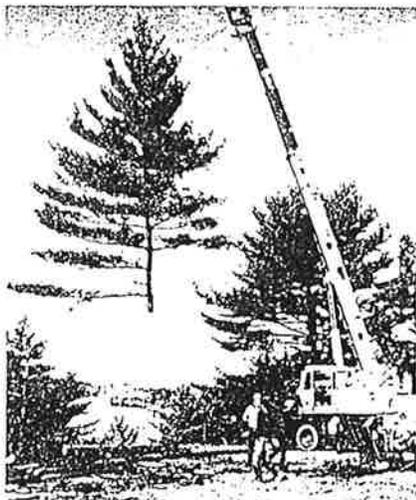
Another protective treatment involves integrated pest management (IPM) which may involve the careful use of pesticides or fertilizer to aid in the recovery of a diseased, injured, or deteriorated plants, or to protect the plant from further decline.

Preservation efforts for historic vegetation may focus on ongoing

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maintenance and management activities which perpetuate the historic appearance, structure, or components of the landscape. This includes mowing or harvesting which sustains the structure and open quality of a field, or any other cyclical maintenance project which is essential to retain the form and character of the vegetation feature. Preservation is the most important treatment since vegetation requires constant management in order to retain overall the structure or appearance of the landscape. The process of removal and replacement or renewal of vegetation is an important component of preservation.

Mowing and pruning are necessary and important maintenance practices, without which vegetation features may be lost or change dramatically and thus affect the historic character. Features that are composed of collections of individual plants such as allees, hedges, or massings of ornamental shrubs may require periodic replacement of individual plants. When the individual elements are deteriorated or missing so that the historic feature as a whole is no longer discernible, the entire feature should be replaced. This is a common issue for hedges, hedgerows, or allee plantings whose individual trees may have died or are deteriorated due to age or poor maintenance.



Without proper maintenance, major landscape features may be lost due to vegetation growth, requiring expensive means to restore the character of an historic property. Here, a volunteer white pine is removed by crane from the historic vista of the Moseley Estate, now Maudslay State Park in Newburyport, MA. Photo by Lauren Meier.

It may also be necessary to replace deteriorated, overgrown, diseased, or dying plant material in order to preserve the historic character of the property. Propagating existing historic plant material for replacement later on provides appropriate replacement material and helps to perpetuate the historic genetic material. In addition to replacement, regular removal of vegetation which crowds historic views or other significant landscape features may be required. Invasive vegetation that damages historic water systems, paths, roads, terraces, or structures, or causes the loss of a significant view or visual relation, should be removed.

In vernacular landscapes, continuing traditional maintenance practices or substituting modern management practices may be necessary to perpetuate the historic scene. In some instances, modern agricultural practices may not adequately preserve the historic scene because of the size of the fields required to accommodate modern machinery. In other cases, as in active rural agricultural communities, perpetuation of a particular crop may not be as important as the retention of the gross landscape patterns.

Restoration may require the removal of later additions and the recreation of missing features in order to reestablish the appearance of the property as it looked during an earlier period. For this reason, the historic vegetation, both extant and missing, must be adequately documented before the restoration effort begins. This includes gathering as much information as possible on the types of plants used on the site and comparing this information to the historic appearance. Secondary sources should also be consulted in order to substantiate dates of introduction into cultivation, the commercial availability of the plant varieties, and their popularity during the historic period.

The restoration of a historic property may require replacing an entire vegetation feature such as a hedge, allee, or field that is missing and which contributed to the historic character of the property during the period of significance. Missing historic vegetation which did not exist during the defined period of signifi-



Laura Cote, seasonal gardener, is maintaining the historic boxwood hedge at the Longfellow Historic Site to appropriate historic period specifications. Photo by Charles Pepper, courtesy the Frederick Law Olmsted National Historic Site.

cance and period of restoration should not be replaced.

Existing historic vegetation that was present during the period of significance and contributes to the historic character of the property should be protected and retained. Similarly, historic vegetation that has matured since the period of significance should also be kept as long as the scale and appearance of the feature does not compromise the historic character of the property. If the scale of the mature vegetation is not consistent with the character of the period for restoration, methods such as pruning or thinning which reduce the scale of the feature should be considered before removal. Replacing matured woodlands with new seedlings in order to create an appearance of the landscape as it appeared at an earlier date, when retaining the matured vegetation would have accomplished the same goals, is not an appropriate treatment. In cases where pruning or thinning does not accomplish the historic effect, the entire feature should be removed and replaced.

Often, replacement of lost historic vegetation is hampered by poor documentation or by the fact that many historic species and varieties are no longer available. (For more information on replacement and substitution, please refer to the following section).

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Principles for Preserving Historic Plant Material

(continued from page 19)

Stabilization is generally considered a building treatment, since it is used to reestablish the stability of an unsafe, damaged, or deteriorated property. For vegetation, there are a few instances when stabilization may be appropriate, such as staking or cabling trees that have blown over or major pruning efforts which remove limbs that threaten the stability of the tree.

Since the objective of **rehabilitation** is to make possible an "efficient contemporary use," appropriate work may involve the preservation of the existing historic fabric or the introduction of new construction and features. New vegetation to screen new features or uses may be necessary to reduce the visual impact of the new features. New construction is often a component of rehabilitation, necessitating protective treatment of historic plant material. Trees will not tolerate damage to their root system without showing some kind of effect and thus should be adequately protected during site or building construction.

The historic use, appearance and type of plant material should be accurately documented before considering reconstruction. Reconstruction of historic landscapes should only be considered when sufficient documentation exists, appropriate materials can be found to accurately recreate the historic appearance of the property and when the interpretive objective for the property necessitates reconstruction. As with restoration, the historic vegetation should be incorporated into every reconstruction project.

Considerations for Replacement and Substitution

The Secretary's Standards for Historic Preservation Projects recommends that "new material should match the material being replaced in composition, design, color, texture, and other visual properties." This principle applies generally to vegetation, though the original species and variety as well as the plant's horticultural characteristics should also be considered. In many landscapes, at

least some of the historic plant material is still extant. Since this material is historic fabric, it should be retained. Diseased or damaged vegetation should also be carefully cared for before removal and replacement is considered.

However, removal and replacement of existing historic material or the replacement of lost fabric may be necessary if the existing material is too severely damaged or diseased, or if it has overgrown and pruning will not accomplish the treatment objective. In landscapes where some of the historic plant material remains, opportunities exist for propagation and exact, in-kind replacement of the historic fabric. This option is not available for any other historic resource, and is one that should be used whenever appropriate. Propagation of existing plant material has many advantages including genetic continuity with the historic period. This is particularly important since the landscape itself is regarded as an historic record, and modifying that record should be avoided or minimized.

Often, identification of historic varieties is difficult and must be verified over several years. Purchasing replacement material for incorrectly identified extant material would, of course, result in inadvertent alteration of the historic plant



Historically, Fairsted, the home and office of Frederick Law Olmsted, was covered with *Wisteria* and *Actinidia*. Today, NPS staff at the National Historic Site are experimenting with trellis systems that are designed to accurately re-create the historic appearance while minimizing impact to both historic structure and plant material. This is the trellis and *Wisteria sinensis* after one season of growth. Photo by Charles Pepper, courtesy the Frederick Law Olmsted National Historic Site.

material. Even if the correct plant material is available, the amount of variation present in a species or variety in different regions of the country may result in replacement with a slightly different plant. Replacement of extant historic material through propagation avoids these problems and ensures perpetuation of historic plant species and varieties.

In some instances, replacement of the original species or variety may not be possible. This may be due to changes in the site's growing conditions, disease, or simply because the original is no longer available or has disappeared from cultivation. In either case, substitution is sometimes necessary. In decisions on substitution, care should be taken to match the visual, functional, and horticultural characteristics of the historic plant as closely as possible. These attributes include the form, shape, and texture of the original, as well as its seasonal features such as bloom time and color, fruit, and fall foliage.

There are certain plants with such distinctive characteristics that it may be virtually impossible to duplicate their visual effect. This is true in the case of the unique, umbrella-like shape of the American Elm, *Ulmus americana*. The elm, once the great American street tree, has been reduced in number due to Dutch Elm disease, *Ceratocystis ulmi* (Buisman). Yet its form is impossible to replicate making decisions about an acceptable substitute material very difficult. As a result, some historic landscape managers have continued to plant American Elm or the new disease resistant variety known as Liberty Elm, *U. americana* 'Liberty.'

Another example of a plant which is difficult to substitute is the Flowering Dogwood, *Cornus florida* and its close relative, the Western Dogwood, *C. nuttalli*. Both are native trees, used extensively for their distinctive shape and showy white bracts. They have been seriously affected by an anthracnose disease which causes gradual loss of the lower branches and foliage. Unfortunately, replacement with the same species is impractical since the disease may reinfest the new tree. No alternative provides the exact combination of form, size, bloom time,

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and bloom color, let alone the fruit and fall foliage characteristics. In these cases it is important to determine what the most critical aspects of the plant are in their given location, and reproduce a limited number of characteristics to the greatest extent possible. Substituting another dogwood species, such as the Chinese Dogwood, *Cornus kousa* may not be an acceptable alternative if the time of bloom is critical to an overall effect. Thus, substitutions for a given plant species may vary on a site to site basis.

Similar issues arise in the replacement of flowering perennial or annual plant material, such as is used in borders or beds. In this case, careful decisions must be made regarding the historic period and the selected treatment. Certain non-woody perennial plants are quite long-lived and an effort should be made to determine if any of the historic plant material remains. If it is necessary to replace perennial plant material, the selection should be based on site records as well as other documentary evidence which provides information on the use and introduction of plants during the historic period. It is also important to determine the height, color, and seasonal qualities of the original planting in order to select accurate replacement plants. If substitution of the historic plant is necessary, then the selection should ensure that the historic effect is reproduced to the maximum extent possible. If the site research turns up very little site and species-specific information, then the visual effect should be followed as closely as possible.

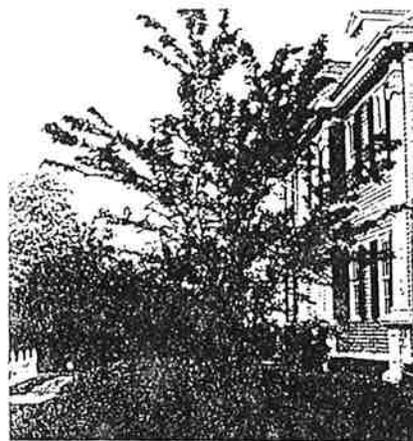
In summary, extant historic plant material should be retained and propagated whenever possible to ensure continuity of the living historic fabric. Plant material that cannot be, or was not propagated before it was lost should be identified and replaced in-kind. If it is determined that replacement with new plants or substitution of the historic plant material is necessary, it is important to keep accurate site records, to allow future generations to distinguish between historic fabric and later alterations and additions to the landscape.

Conclusion

Historic vegetation must be recognized as an integral part of the fabric of most historic properties and should be considered during any preservation effort. Although considering plant material as historic fabric raises new preservation issues not encountered with inanimate materials, the opportunity exists for long-term perpetuation of this living historic fabric through propagation.

Stewardship of historic properties should, to the maximum extent possible, include the preservation of historic plant material to prevent further loss of historic species and cultivars. National leadership in historic species cultivation and propagation is greatly needed if we are to continue preserving historic landscapes. Partnerships should be developed between Federal, state, and local governments and private organizations which manage historic landscapes, and arboretums and agricultural colleges who propagate historic varieties, store genetic material, and train arborists and horticulturists in historic landscape management.

Perhaps the best thing we can do to preserve historic landscapes is to increase skill, knowledge, and attention to vegetation management at each historic site. Management of historic properties should routinely



For some plants, no substitute species exist which recreate the appearance of horticultural species of the original. In this case, cultivars, such as the 'Liberty' Elm provide acceptable disease resistant replacements. This tree is a replacement for a missing historic elm at the Longfellow National Historic Site. Photo by Charles Pepper, courtesy the Frederick Law Olmsted National Historic Site.

include active management of historic vegetation including propagation, repair and, when appropriate, removal and replacement of historic plant material. These objectives will help ensure the continuation of the living historic fabric, part of a rich historic document, the landscape.

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Preservation Issues for Living Historic Fabric

Vegetation is a dynamic material, subject to seasonal change as well as the cycle of growth, maturity, and decay. As a result, many of the traditional approaches to preservation practice for inanimate objects need to be modified for preservation of this living historic fabric.

1. Integrity is a difficult concept to evaluate in landscapes, since the growth and death of vegetation can have a tremendous effect on the character of the property. Simple actions such as deferring maintenance can result in the loss of significant, character-defining vistas, or the death of important vegetation features. At the same time, the loss of some plant material such as annuals or perennials does not necessarily compromise the integrity of the landscape since many are inherently short-lived and subject to constant removal and replacement. Thus, when evaluating the integrity of the landscape, it is important to keep the

dynamics of the existing vegetation in mind while attempting to preserve or restore the historic appearance of the site.

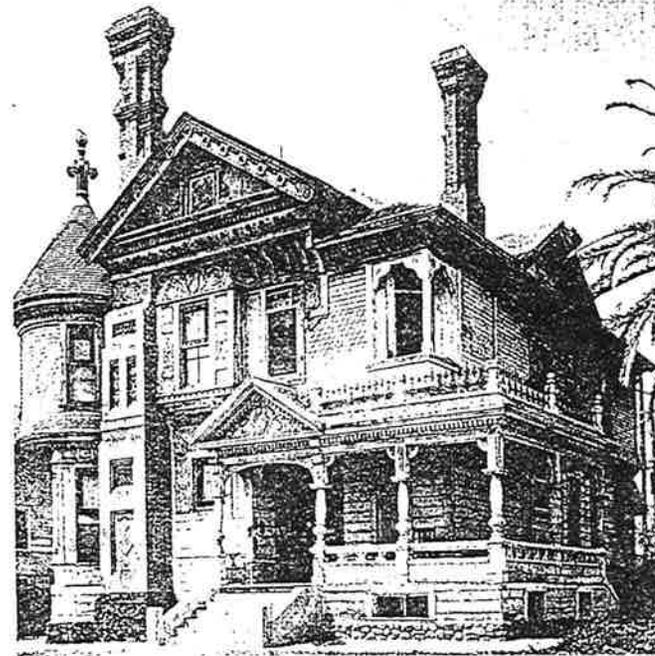
2. Most historic landscapes have evolved over a long period of time, which complicates preservation decisions. It may be difficult to interpret or accurately replicate the appearance of a landscape during its identified period of significance since the vegetation may have grown or changed considerably. It may be both inappropriate and too costly to remove mature vegetation in order to replace it with younger seedlings. Though this solution may replicate the property's appearance at a specific point in time, it may also result in the unnecessary removal of important historic fabric.

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Standards for Preservation & Guidelines for Preserving Historic Buildings

Preservation is defined as the act or process of applying measures necessary to sustain the existing form, integrity, and materials of an historic property. Work, including preliminary measures to protect and stabilize the property, generally focuses upon the ongoing maintenance and repair of historic materials and features rather than extensive replacement and new construction. New exterior additions are not within the scope of this treatment; however, the limited and sensitive upgrading of mechanical, electrical, and plumbing systems and other code-required work to make properties functional is appropriate within a preservation project.



Standards for Preservation

1. A property will be used as it was historically, or be given a new use that maximizes the retention of distinctive materials, features, spaces, and spatial relationships. Where a treatment and use have not been identified, a property will be protected and, if necessary, stabilized until additional work may be undertaken.
2. The historic character of a property will be retained and preserved. The replacement of intact or repairable historic materials or alteration of features, spaces, and spatial relationships that characterize a property will be avoided.
3. Each property will be recognized as a physical record of its time, place, and use. Work needed to stabilize, consolidate, and conserve existing historic materials and features will be physically and visually compatible, identifiable upon close inspection, and properly documented for future research.
4. Changes to a property that have acquired historic significance in their own right will be retained and preserved.
5. Distinctive materials, features, finishes, and construction techniques or examples of craftsmanship that characterize a property will be preserved.
6. The existing condition of historic features will be evaluated to determine the appropriate level of intervention needed. Where the severity of deterioration requires repair or limited replacement of a distinctive feature, the new material will match the old in composition, design, color, and texture.
7. Chemical or physical treatments, if appropriate, will be undertaken using the gentlest means possible. Treatments that cause damage to historic materials will not be used.
8. Archeological resources will be protected and preserved in place. If such resources must be disturbed, mitigation measures will be undertaken.

Guidelines for Preserving Historic Buildings

Introduction

In Preservation, the options for replacement are less extensive than in the treatment, Rehabilitation. This is because it is assumed at the outset that building materials and character-defining features are essentially intact, i.e., that more historic fabric has survived, unchanged over time. The expressed goal of the Standards for Preservation and Guidelines for Preserving Historic Buildings is retention of the building's existing form, features and detailing. This may be as simple as basic maintenance of existing materials and features or may involve preparing a historic structure report, undertaking laboratory testing such as paint and mortar analysis, and hiring conservators to perform sensitive work such as reconstituting interior finishes. Protection, maintenance, and repair are emphasized while replacement is minimized.

Identify, Retain, and Preserve Historic Materials and Features

The guidance for the treatment Preservation begins with recommendations to identify the form and detailing of those architectural materials and features that are important in defining the building's historic character and which must be retained in order to preserve that character. Therefore, guidance on *identifying, retaining, and preserving* character-defining features is always given first. The character of a historic building may be defined by the form and detailing of exterior materials, such as masonry, wood, and metal; exterior features, such as roofs, porches, and windows; interior materials, such as plaster and paint; and interior features, such as moldings and stairways, room configuration and spatial relationships, as well as structural and mechanical systems; and the building's site and setting.

Stabilize Deteriorated Historic Materials and Features as a Preliminary Measure

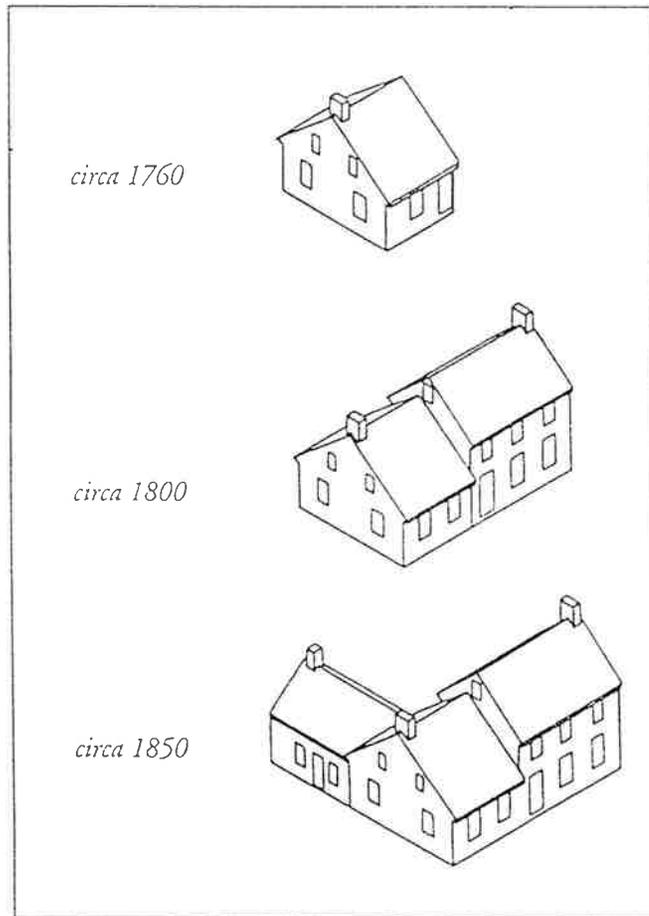
Deteriorated portions of a historic building may need to be protected through preliminary stabilization measures until additional work can be undertaken. *Stabilizing* may include structural reinforcement, weatherization, or correcting unsafe conditions. Temporary stabilization should always be carried out in such a manner that it detracts as little as possible from the historic building's appearance. Although it may not be necessary in every preservation project, stabilization is nonetheless an integral part of the treatment Preservation; it is equally applicable, if circumstances warrant, for the other treatments.

Protect and Maintain Historic Materials and Features

After identifying those materials and features that are important and must be retained in the process of Preservation work, then *protecting and maintaining* them are addressed. Protection generally involves the least degree of intervention and is preparatory to other work. For example, protection includes the maintenance of historic materials through treatments such as rust removal, caulking, limited paint removal, and re-application of protective coatings; the cyclical cleaning of roof gutter systems; or installation of fencing, alarm systems and other temporary protective measures. Although a historic building will usually require more extensive work, an overall evaluation of its physical condition should always begin at this level.

Repair (Stabilize, Consolidate, and Conserve) Historic Materials and Features

Next, when the physical condition of character-defining materials and features requires additional work, *repairing* by *stabilizing, consolidating, and*



This three-part drawing shows the evolution of a farm house over time. Such change is part of the history of the place and is respected within the treatment, Preservation. Drawing: Center for Historic Architecture and Engineering, University of Delaware (adapted from Preservation Brief 35: Understanding Old Buildings).

conserving is recommended. Preservation strives to retain existing materials and features while employing as little new material as possible. Consequently, guidance for repairing a historic material, such as masonry, again begins with the least degree of intervention possible such as strengthening fragile materials through consolidation, when appropriate, and repointing with mortar of an appropriate strength. Repairing masonry as well as wood and architectural metal features may also include patching, splicing, or otherwise reinforcing them using recognized preservation methods. Similarly, within the treatment Preservation, portions of a historic structural system could be reinforced using contemporary materials such as steel rods. All work should be physically and visually compatible, identifiable upon close inspection and documented for future research.

Limited Replacement In Kind of Extensively Deteriorated Portions of Historic Features

If repair by stabilization, consolidation, and conservation proves inadequate, the next level of intervention involves the *limited replacement in kind* of extensively deteriorated or missing *parts* of features when there are surviving prototypes (for example, brackets, dentils, steps, plaster, or portions of slate or tile roofing). The replacement material needs to match the old both physically and visually, i.e., wood with wood, etc. Thus, with the exception of hidden structural reinforcement and new mechanical system components, substitute materials are not appropriate in the treatment Preservation. Again, it is important that all new material be identified and properly documented for future research.

If prominent features are missing, such as an interior staircase, exterior cornice, or a roof dormer, then a Rehabilitation or Restoration treatment may be more appropriate.

Energy Efficiency/Accessibility
Considerations/Health and Safety Code
Considerations

These sections of the Preservation guidance address work done to meet accessibility requirements and health and safety code requirements; or limited retrofitting measures to improve energy efficiency. Although this work is quite often an important aspect of preservation projects, it is usually not part of the overall process of protecting, stabilizing, conserving, or repairing character-defining features; rather, such work is assessed for its potential negative impact on the building's character. For this reason, particular care must be taken not to obscure, damage, or destroy character-defining materials or features in the process of undertaking work to meet code and energy requirements.

Preservation as a Treatment. When the property's distinctive materials, features, and spaces are essentially intact and thus convey the historic significance without extensive repair or replacement; when depiction at a particular period of time is not appropriate; and when a continuing or new use does not require additions or extensive alterations, Preservation may be considered as a treatment. Prior to undertaking work, a documentation plan for Preservation should be developed.

Building Site

Recommended

Identifying, retaining, and preserving buildings and their features as well as features of the site that are important in defining its overall historic character. Site features may include circulation systems such as walks, paths, roads, or parking; vegetation such as trees, shrubs, fields, or herbaceous plant material; landforms such as terracing, berms or grading; furnishings such as lights, fences, or benches; decorative elements such as sculpture, statuary or monuments; water features including fountains, streams, pools, or lakes; and subsurface archeological features which are important in defining the history of the site.

Retaining the historic relationship between buildings and the landscape.

Stabilizing deteriorated or damaged building and site features as a preliminary measure, when necessary, prior to undertaking appropriate preservation work.



Not Recommended

Altering buildings and their features or site features which are important in defining the overall historic character of the property so that, as a result, the character is diminished.

Removing or relocating buildings or landscape features, thus destroying the historic relationship between buildings and the landscape.

Failing to stabilize a deteriorated or damaged building or site feature until additional work is undertaken, thus allowing further damage to occur to the building site.

Drayton Hall, near Charleston, South Carolina, is an excellent example of an evolved 18th century plantation. Of particular note in this photograph are the landscape features added in the late 19th century—a reflecting pond and rose mound. With an overall Preservation treatment plan, these later features have been retained and protected. If a Restoration treatment had been selected, later features of the landscape as well as changes to the house would have been removed. Photo: Courtesy, National Trust for Historic Preservation.

Recommended

Protecting and maintaining buildings and sites by providing proper drainage to assure that water does not erode foundation walls; drain toward the building; or damage or erode the landscape.

Minimizing disturbance of terrain around buildings or elsewhere on the site, thus reducing the possibility of destroying or damaging important landscape features or archeological resources.

Surveying and documenting areas where the terrain will be altered to determine the potential impact to important landscape features or archeological resources.

Protecting, e.g., preserving in place, important archeological resources.

Planning and carrying out any necessary investigation using professional archeologists and modern archeological methods when preservation in place is not feasible.

Preserving important landscape features, including ongoing maintenance of historic plant material.

Protecting building and landscape features against arson and vandalism before preservation work begins, i.e., erecting protective fencing and installing alarm systems that are keyed into local protection agencies.

Providing continued protection of historic building materials and plant features through appropriate cleaning, rust removal, limited paint removal, and re-application of protective coating systems; and pruning and vegetation management.

Not Recommended

Failing to maintain adequate site drainage so that buildings and site features are damaged or destroyed; or alternatively, changing the site grading so that water no longer drains properly.

Introducing heavy machinery into areas where it may disturb or damage important landscape features or archeological resources.

Failing to survey the building site prior to beginning work which results in damage to, or destruction of, important landscape features or archeological resources.

Leaving known archeological material unprotected so that it is damaged during preservation work.

Permitting unqualified personnel to perform data recovery on archeological resources so that improper methodology results in the loss of important archeological material.

Allowing important landscape features to be lost or damaged due to a lack of maintenance.

Permitting the property to remain unprotected so that the building and landscape features or archeological resources are damaged or destroyed.

Removing or destroying features from the buildings or site such as wood siding, iron fencing, masonry balustrades, or plant material.

Failing to provide adequate protection of materials on a cyclical basis so that deterioration of building and site feature results.

Recommended

Evaluating the existing condition of materials and features to determine whether more than protection and maintenance are required, that is, if repairs to building and site features will be necessary.

Repairing features of the building and site by reinforcing historic materials using recognized preservation methods. The new work should be unobtrusively dated to guide future research and treatment.

Not Recommended

Failing to undertake adequate measures to assure the protection of building and site features.

Removing materials that could be repaired, using improper repair techniques, or failing to document the new work.

The following work is highlighted to indicate that it represents the greatest degree of intervention generally recommended within the treatment Preservation, and should only be considered after protection, stabilization, and repair concerns have been addressed.

Recommended

Limited Replacement in Kind

Replacing in kind extensively deteriorated or missing parts of the building or site where there are surviving prototypes such as part of a fountain, or portions of a walkway. New work should match the old in materials, design, color, and texture; and be unobtrusively dated to guide future research and treatment.

Not Recommended

Replacing an entire feature of the building or site when limited replacement of deteriorated and missing parts is appropriate.

Using replacement material that does not match the building site feature; or failing to properly document the new work.

Setting (District/Neighborhood)

Recommended

Identifying retaining, and preserving building and landscape features which are important in defining the historic character of the setting. Such features can include roads and streets, furnishings such as lights or benches, vegetation, gardens and yards, adjacent open space such as fields, parks, commons or woodlands, and important views or visual relationships.

Retaining the historic relationship between buildings and landscape features of the setting. For example, preserving the relationship between a town common and its adjacent historic houses, municipal buildings, historic roads, and landscape features.

Stabilizing deteriorated or damaged building and landscape features of the setting as a preliminary measure, when necessary, prior to undertaking appropriate preservation work.

Protecting and maintaining historic building materials and plant features through appropriate cleaning, rust removal, limited paint removal, and reapplication of protective coating systems; and pruning and vegetation management.

Protecting building and landscape features against arson and vandalism before preservation work begins by erecting protective fencing and installing alarm systems that are keyed into local preservation agencies.

Evaluating the existing condition of the building and landscape features to determine whether more than protection and maintenance are required, that is, if repairs to features will be necessary.

Not Recommended

Altering those features of the setting which are important in defining the historic character.

Altering the relationship between the buildings and landscape features within the setting by widening existing streets, changing landscape materials, or constructing inappropriately located new streets or parking.

Removing or relocating historic buildings or landscape features, thus destroying their historic relationship within the setting.

Failing to stabilize a deteriorated or damaged building or landscape feature of the setting until additional work is undertaken, thus allowing further damage to the setting to occur.

Failing to provide adequate protection of materials on a cyclical basis which results in the deterioration of building and landscape features.

Permitting the building and setting to remain unprotected so that interior or exterior features are damaged.

Stripping or removing features from buildings or the setting such as wood siding, iron fencing, terra cotta balusters, or plant material.

Failing to undertake adequate measures to assure the protection of building and landscape features.

Recommended

Repairing features of the building and landscape using recognized preservation methods. The new work should be unobtrusively dated to guide future research and treatment.

The following work is highlighted because it represents the greatest degree of intervention generally recommended within the treatment Preservation, and should only be considered after protection, stabilization, and repair concerns have been addressed.

*Recommended***Limited Replacement in Kind**

Replacing in kind extensively deteriorated or missing parts of building and landscape features where there are surviving prototypes such as porch balustrades or paving materials.

Not Recommended

Removing material that could be repaired, using improper repair techniques, or failing to document the new work.

Not Recommended

Replacing an entire feature of the building or landscape when limited replacement of deteriorated and missing parts is appropriate.

Using replacement material that does not match the building or landscape feature; or failing to properly document the new work.



The goal of Preservation is to retain the historic form, materials, and features of the building and its site as they have changed—or evolved—over time. This bank barn was built in the 1820s, then enlarged in 1898 and again in 1914. Today, it continues its role as a working farm structure as a result of sensitive preservation work. This included foundation re-grading; a new gutter system; structural strengthening; and replacement of a severely deteriorated metal roof. Photo: Jack E. Boucher, HABS.

Although the work in the following sections is quite often an important aspect of preservation projects, it is usually not part of the overall process of preserving character-defining features (maintenance, repair, and limited replacement); rather, such work is assessed for its potential negative impact on the building's historic character. For this reason, particular care must be taken not to obscure, alter, or damage character-defining features in the process of preservation work.

Energy Efficiency

Recommended

Masonry/Wood/Architectural Metals

Installing thermal insulation in attics and in unheated cellars and crawlspaces to increase the efficiency of the existing mechanical systems.

Installing insulating material on the inside of masonry walls to increase energy efficiency where there is no character-defining interior molding around the windows or other interior architectural detailing.

Windows

Utilizing the inherent energy conserving features of a building by maintaining windows and louvered blinds in good operable condition for natural ventilation.

Improving thermal efficiency with weatherstripping, storm windows, caulking, interior shades, and if historically appropriate, blinds and awnings.

Installing interior storm windows with air-tight gaskets, ventilating holes, and/or removable clips to insure proper maintenance and to avoid condensation damage to historic windows.

Installing exterior storm windows which do not damage or obscure the windows and frames.

Not Recommended

Applying thermal insulation with a high moisture content in wall cavities which may damage historic fabric.

Installing wall insulation without considering its effect on interior molding or other architectural detailing.

Removing historic shading devices rather than keeping them in an operable condition.

Replacing historic multi-paned sash with new thermal sash utilizing false muntins.

Installing interior storm windows that allow moisture to accumulate and damage the window.

Installing new exterior storm windows which are inappropriate in size or color.

Replacing windows or transoms with fixed thermal glazing or permitting windows and transoms to remain inoperable rather than utilizing them for their energy conserving potential.

*Recommended**Entrances and Porches*

Maintaining porches and double vestibule entrances so that they can retain heat or block the sun and provide natural ventilation.

Interior Features

Retaining historic interior shutters and transoms for their inherent energy conserving features.

Mechanical Systems

Improving energy efficiency of existing mechanical systems by installing insulation in attics and basements.

Building Site

Retaining plant materials, trees, and landscape features which perform passive solar energy functions such as sun shading and wind breaks.

*Setting**(District/Neighborhood)*

Maintaining those existing landscape features which moderate the effects of the climate on the setting such as deciduous trees, evergreen wind-blocks, and lakes or ponds.

Not Recommended

Changing the historic appearance of the building by enclosing porches.

Removing historic interior features which play an energy conserving role.

Replacing existing mechanical systems that could be repaired for continued use.

Removing plant materials, trees, and landscape features that perform passive solar energy functions.

Stripping the setting of landscape features and landforms so that the effects of wind, rain, and sun result in accelerated deterioration of the historic building.

Accessibility Considerations

Recommended

Identifying the historic building's character-defining spaces, features, and finishes so that accessibility code-required work will not result in their damage or loss.

Complying with barrier-free access requirements, in such a manner that character-defining spaces, features, and finishes are preserved.

Working with local disability groups, access specialists, and historic preservation specialists to determine the most appropriate solution to access problems.

Providing barrier-free access that promotes independence for the disabled person to the highest degree practicable, while preserving significant historic features.

Finding solutions to meet accessibility requirements that minimize the impact on the historic building and its site, such as compatible ramps, paths, and lifts.

Not Recommended

Undertaking code-required alterations before identifying those spaces, features, or finishes which are character-defining and must therefore be preserved.

Altering, damaging, or destroying character-defining features in attempting to comply with accessibility requirements.

Making changes to buildings without first seeking expert advice from access specialists and historic preservationists to determine solutions.

Making access modifications that do not provide a reasonable balance between independent, safe access and preservation of historic features.

Making modifications for accessibility without considering the impact on the historic building and its site.

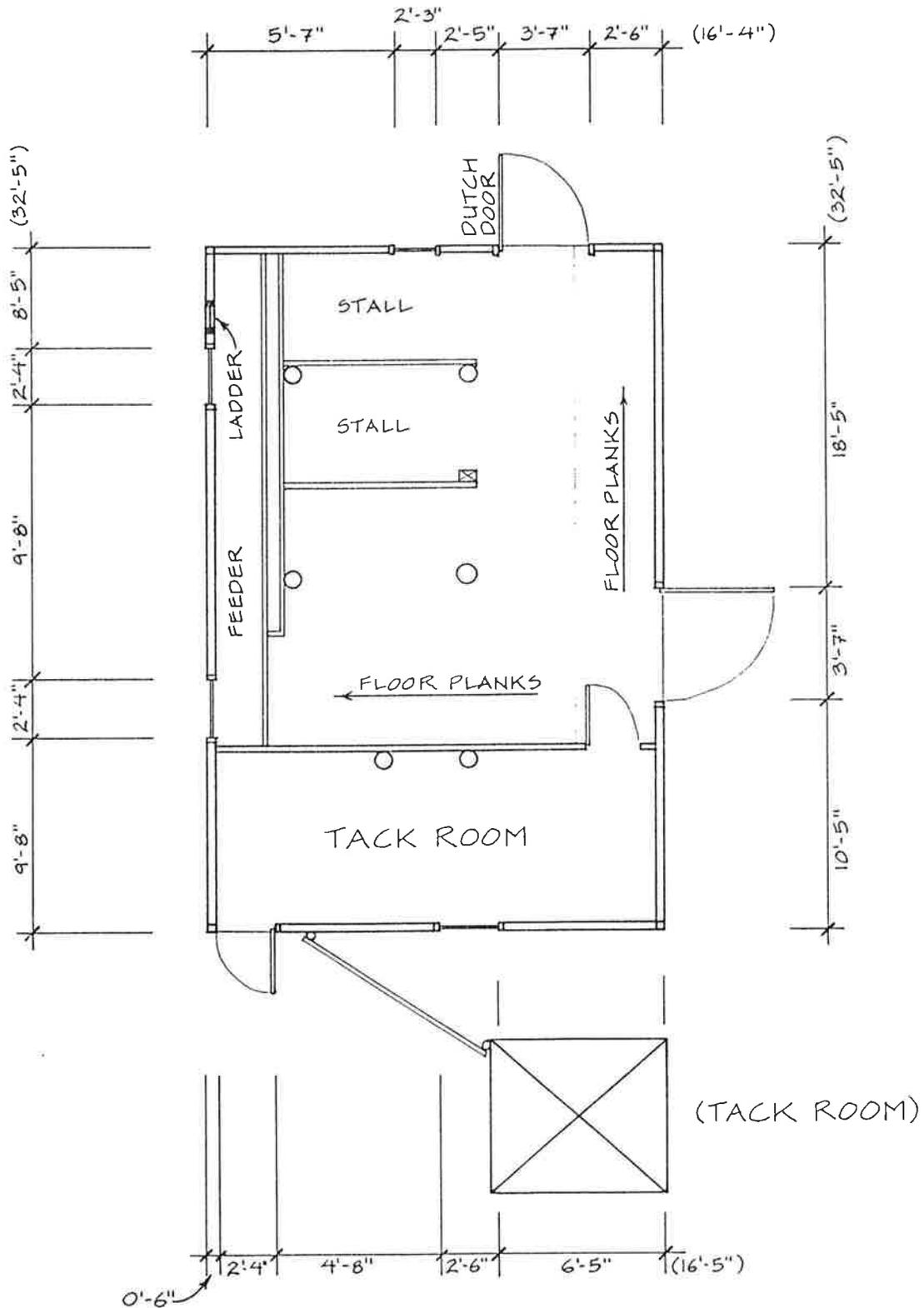
APPENDIX D

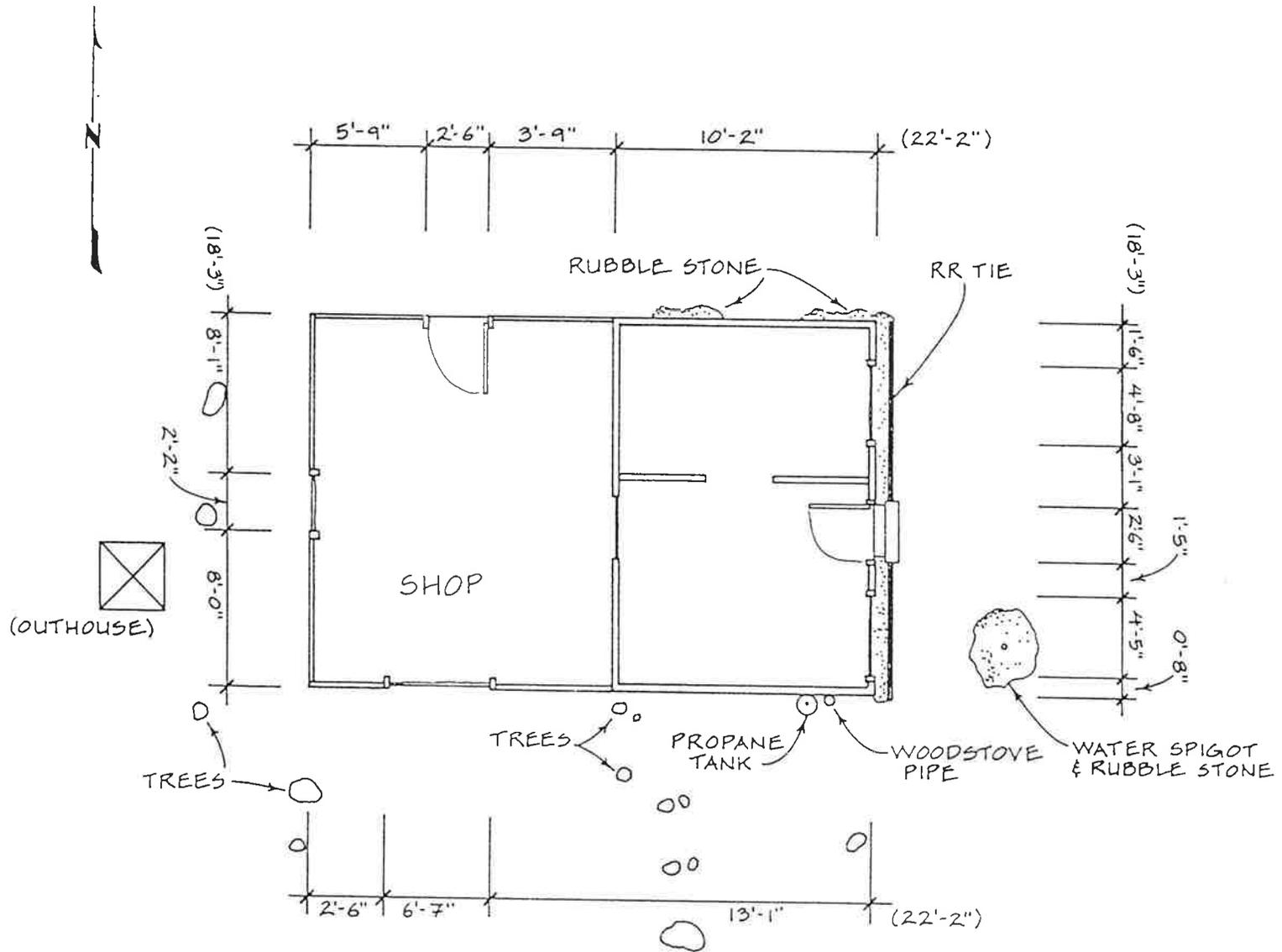
Measured Drawings and Field Notes

BARN (N.T.S.)

BIRCH CREEK RANCH (UPPER TRACT)

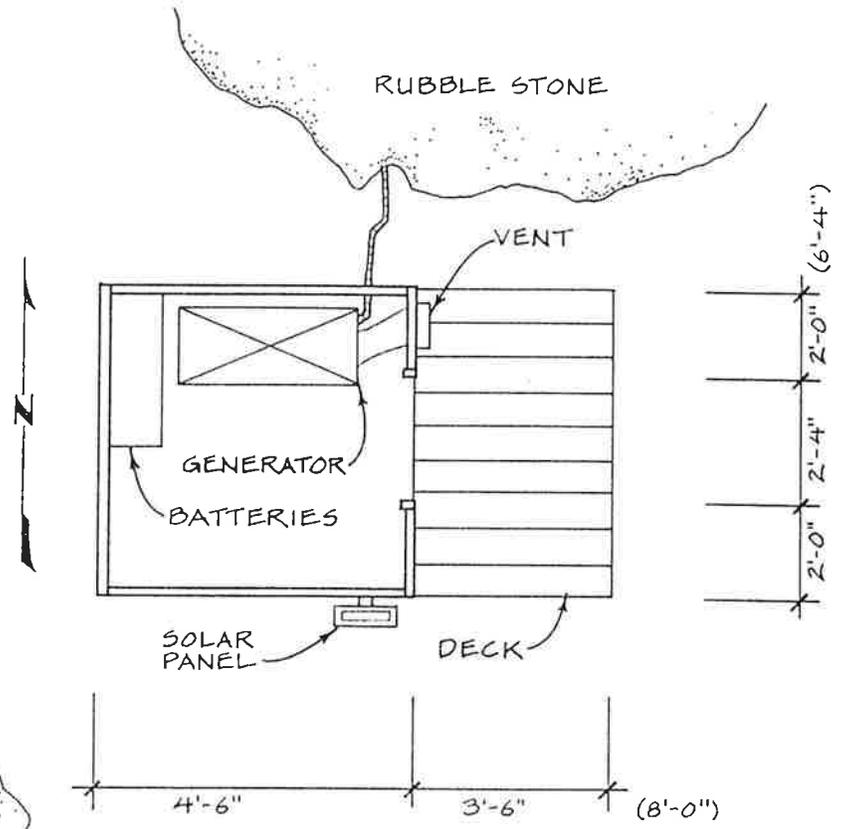
SEPTEMBER 1995



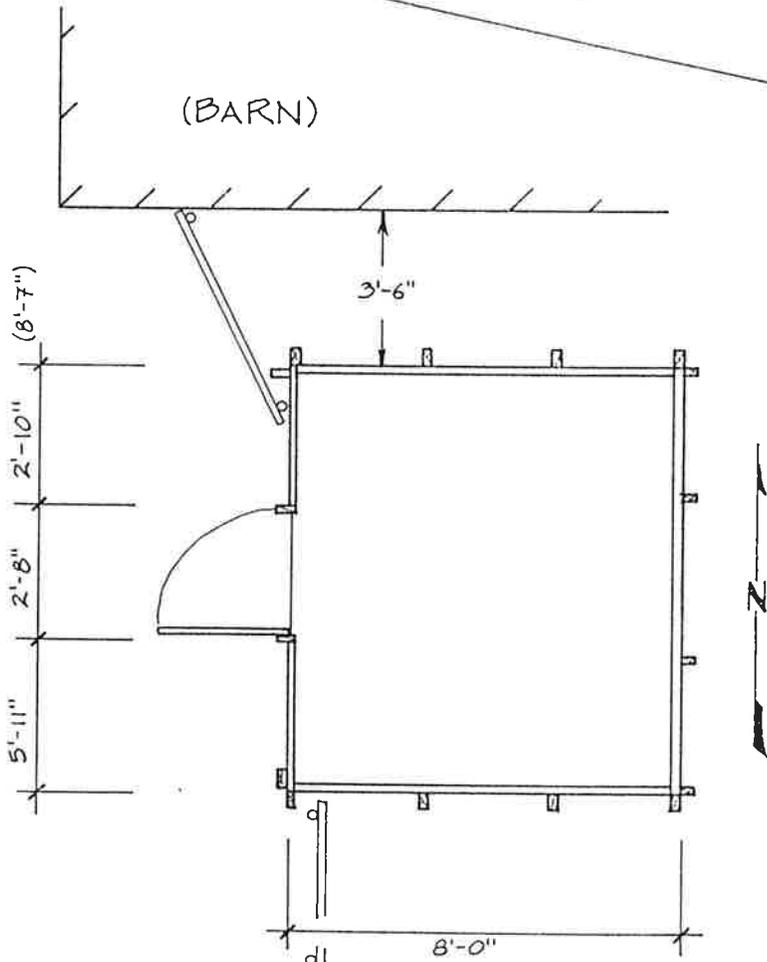


BUNKHOUSE/SHOP (N.T.S.)
 BIRCH CREEK RANCH (UPPER TRACT)
 SEPTEMBER 1995

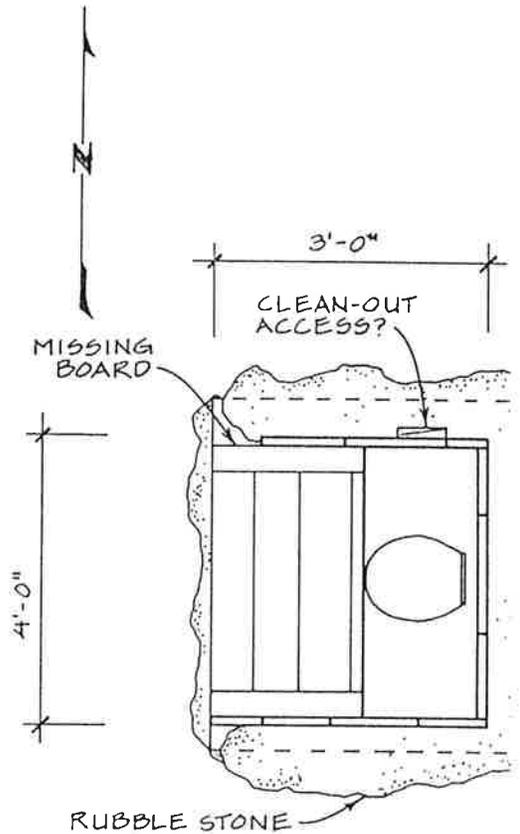
GENERATOR SHED
 BIRCH CREEK RANCH
 (UPPER TRACT)
 SEPTEMBER 1995



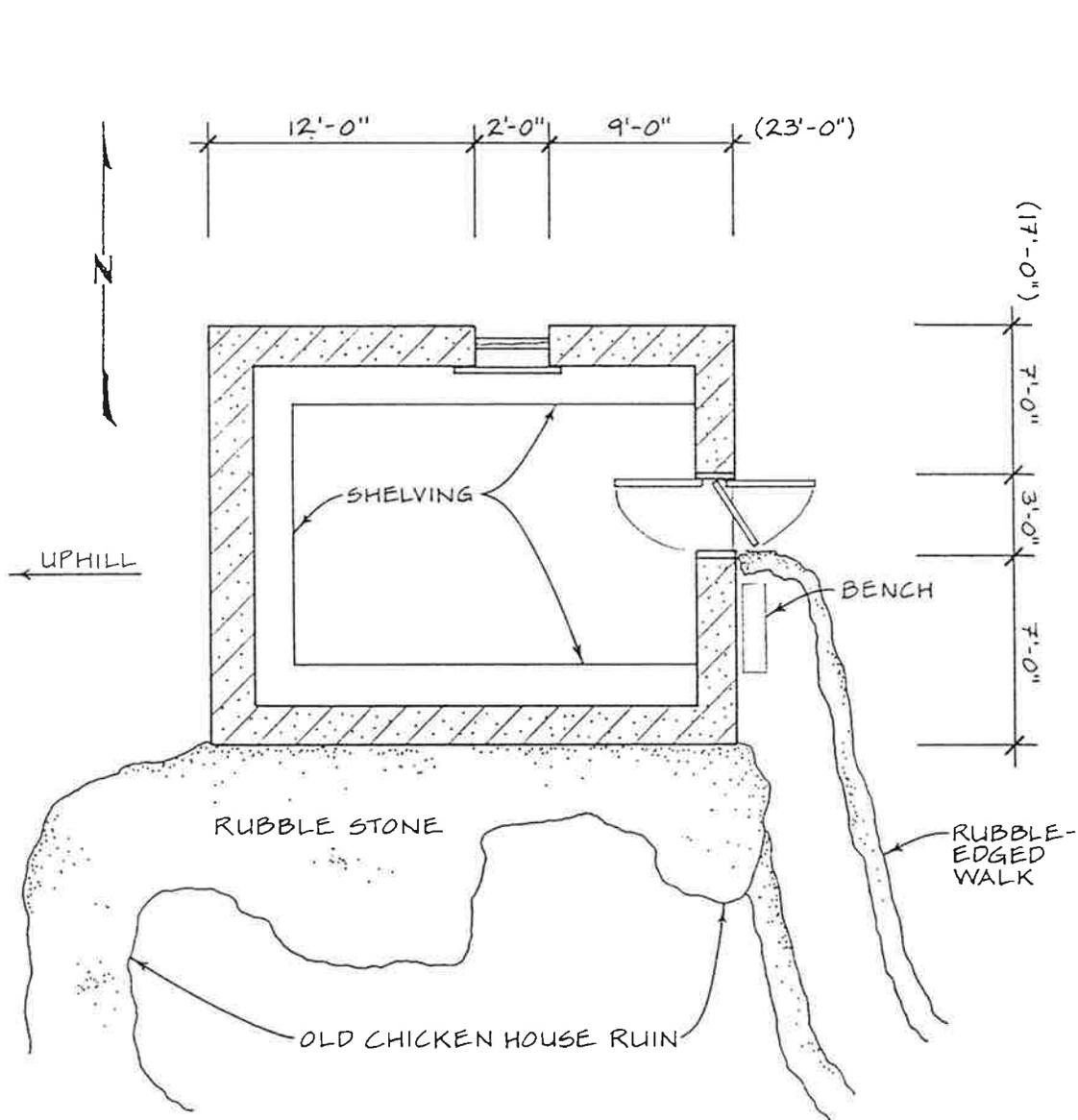
(BARN)



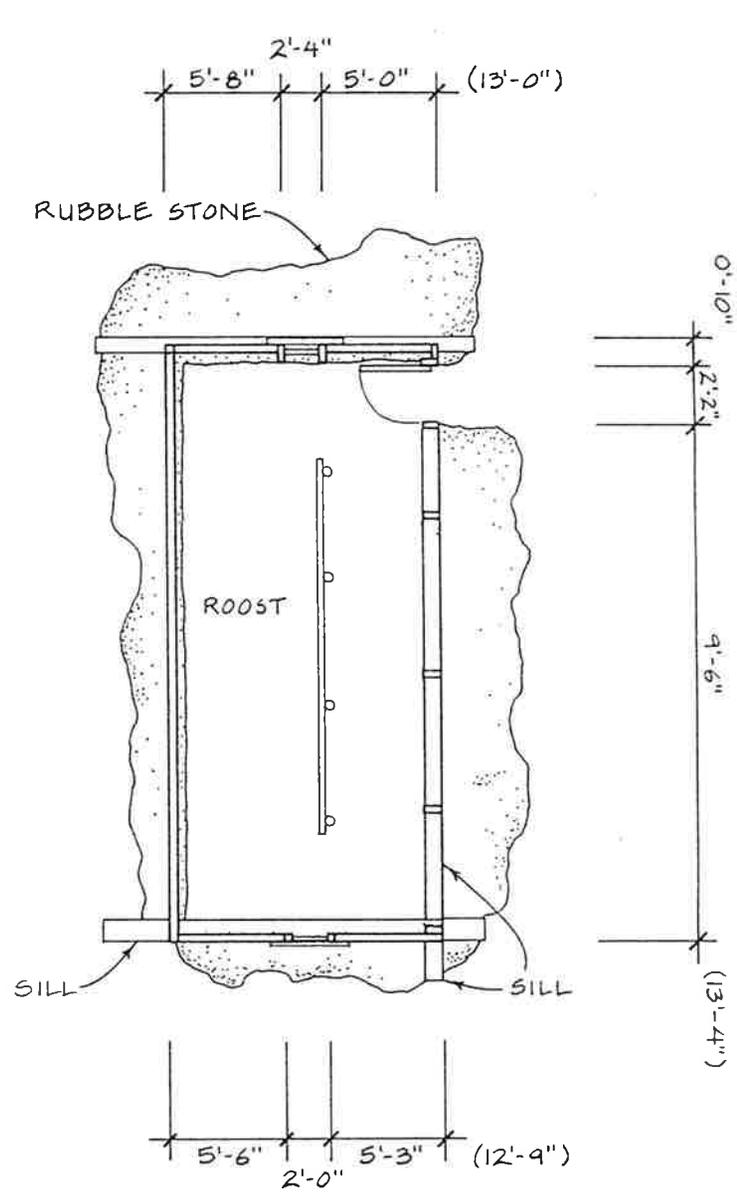
TACK ROOM (N.T.S.)
 BIRCH CREEK RANCH
 (UPPER TRACT)
 SEPTEMBER 1995



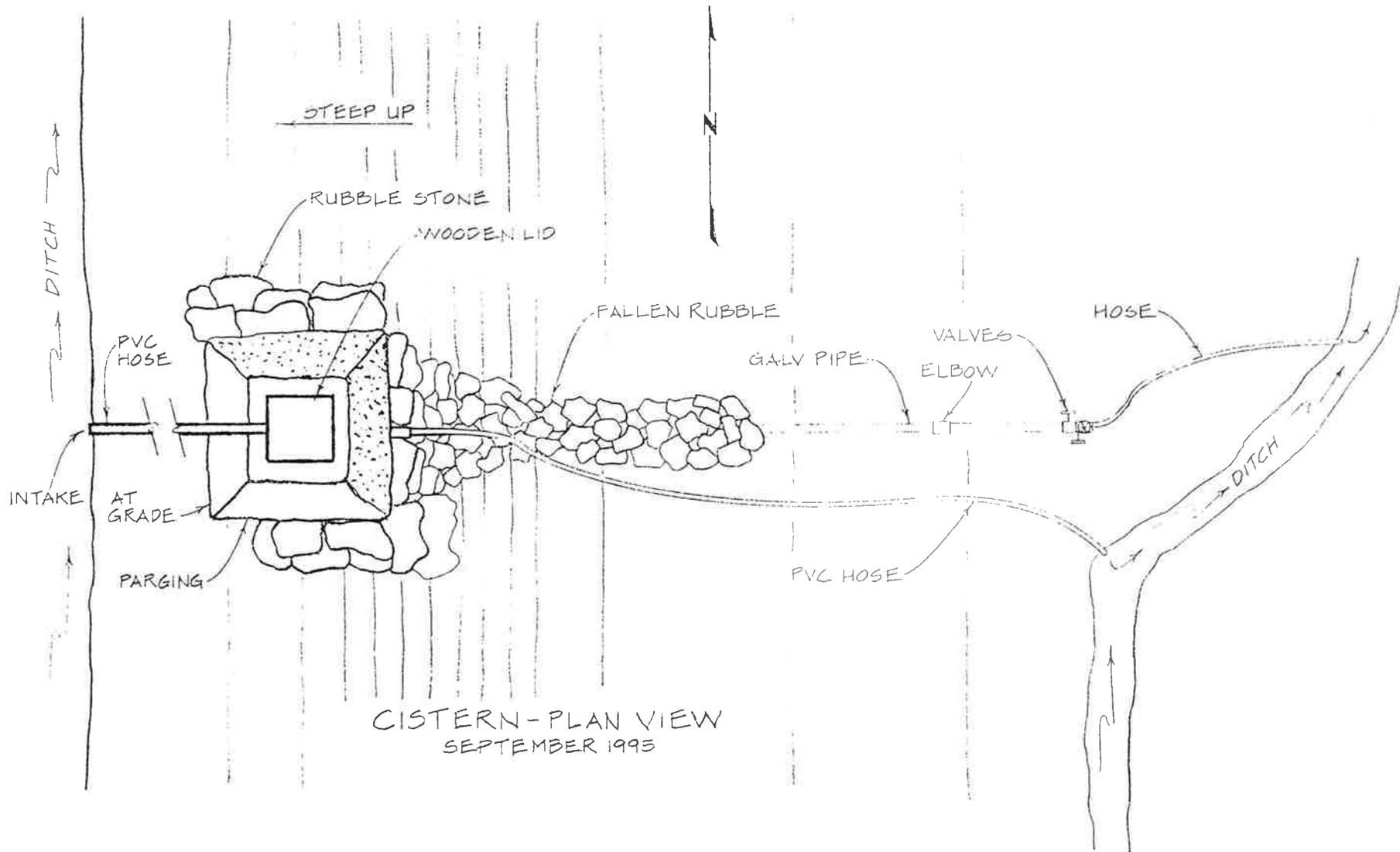
OUTHOUSE (N.T.S.)
 BIRCH CREEK RANCH
 (UPPER TRACT)
 SEPTEMBER 1995



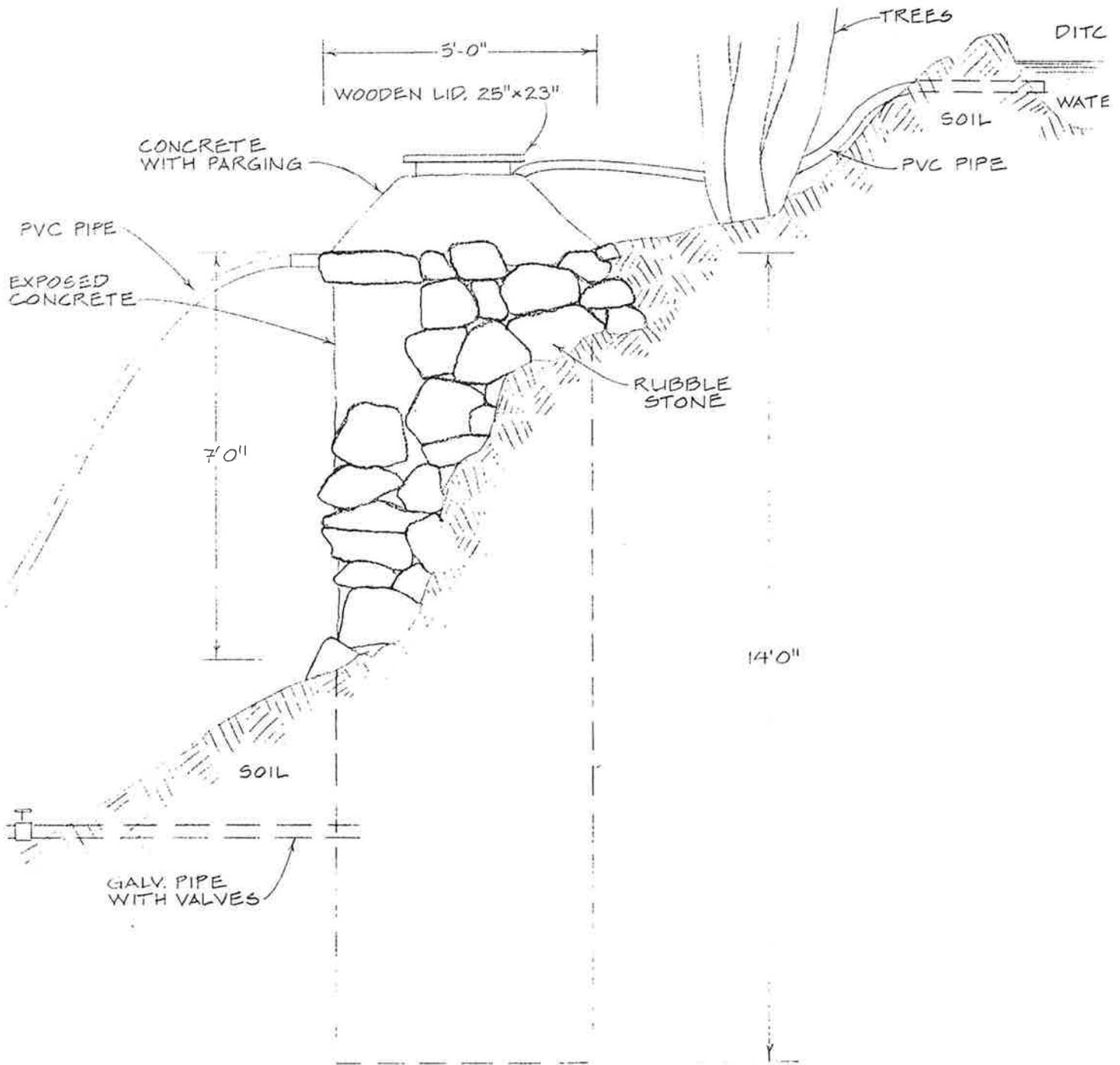
ROOT CELLAR (N.T.S.)
 BIRCH CREEK RANCH
 (UPPER TRACT)
 SEPTEMBER 1995



CHICKEN HOUSE (N.T.S.)
 BIRCH CREEK RANCH
 (UPPER TRACT)
 SEPTEMBER 1995



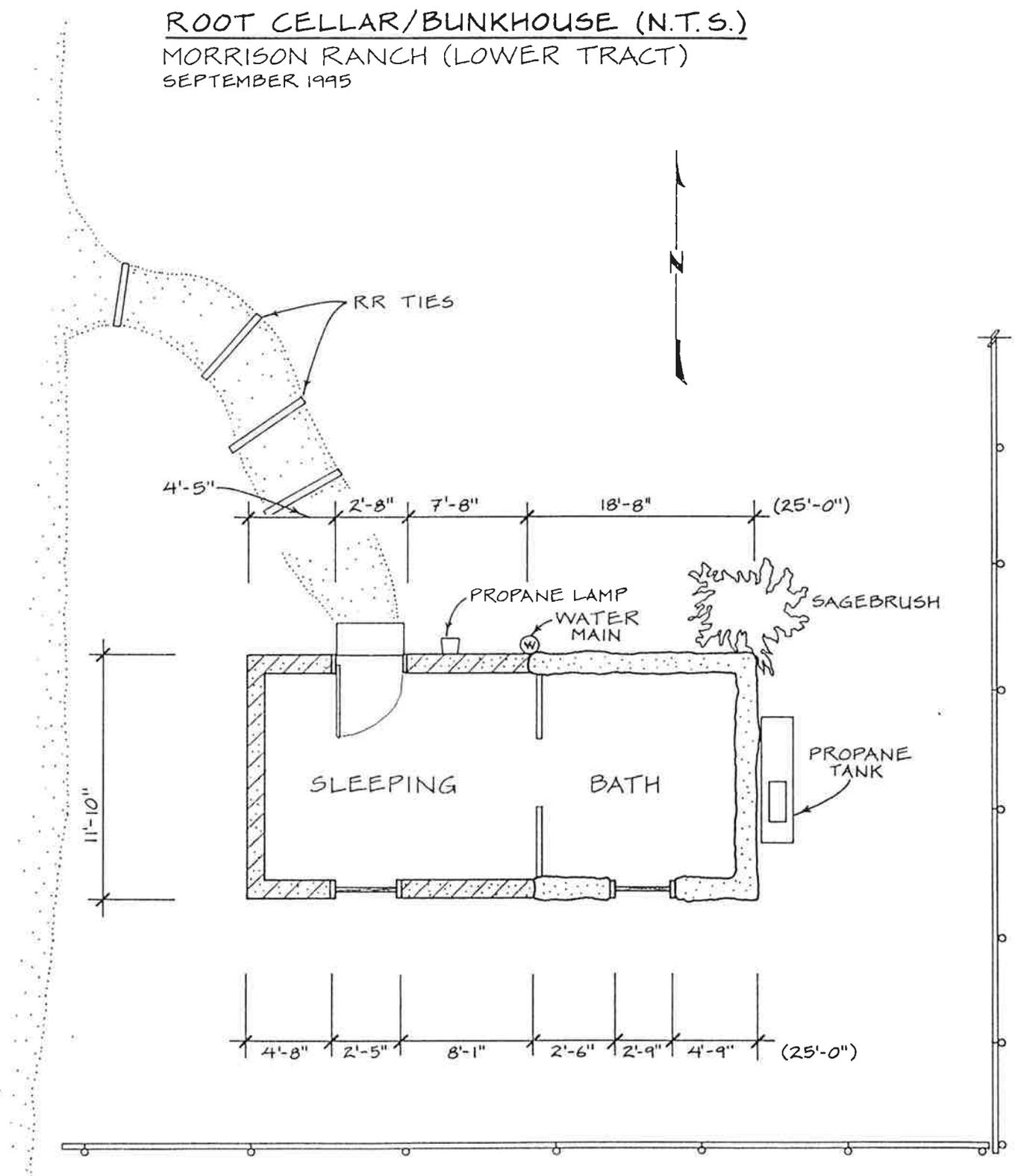
CISTERN-ELEVATION SEPTEMBER 1995



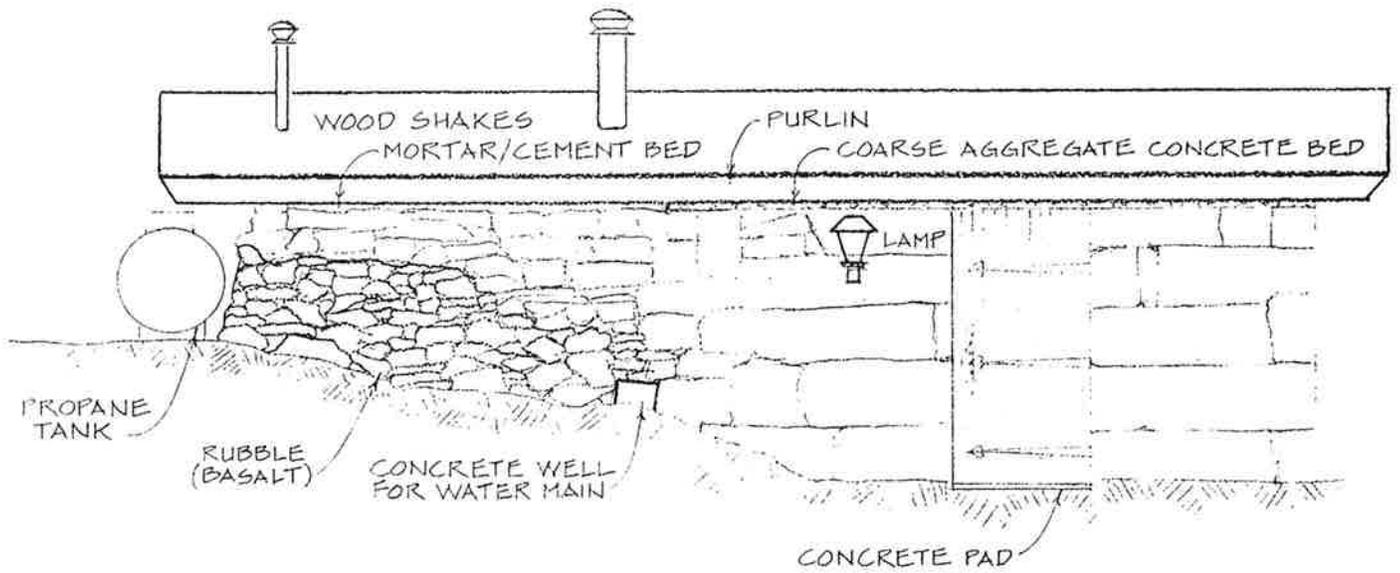
ROOT CELLAR/BUNKHOUSE (N.T.S.)

MORRISON RANCH (LOWER TRACT)

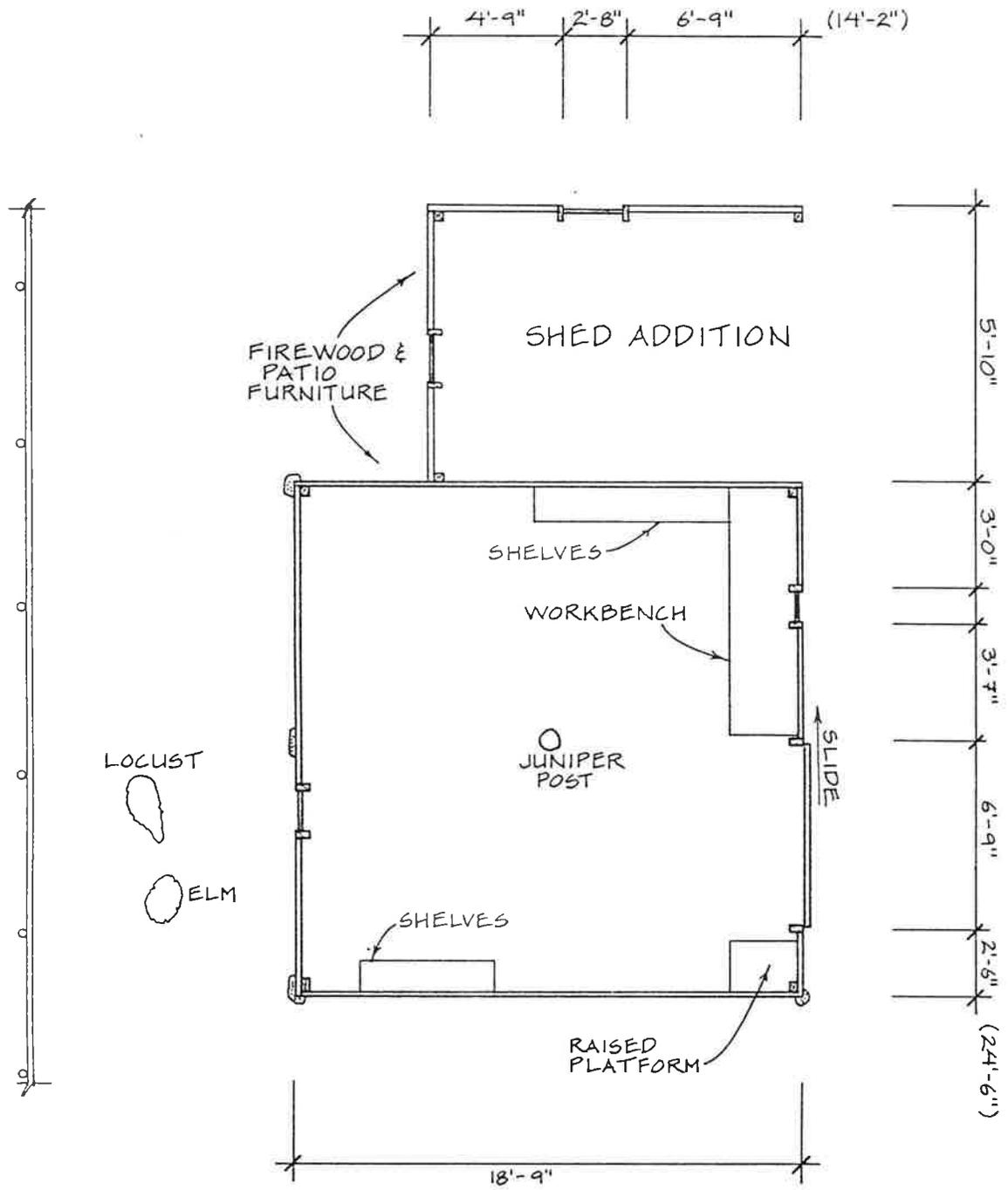
SEPTEMBER 1995



ROOT CELLAR/BUNKHOUSE SEPTEMBER 1995



NORTH ELEVATION



FIREWOOD & PATIO FURNITURE

SHED ADDITION

SHELVES

WORKBENCH

JUNIPER POST

SLIDE

SHELVES

RAISED PLATFORM

LOCUST



ELM



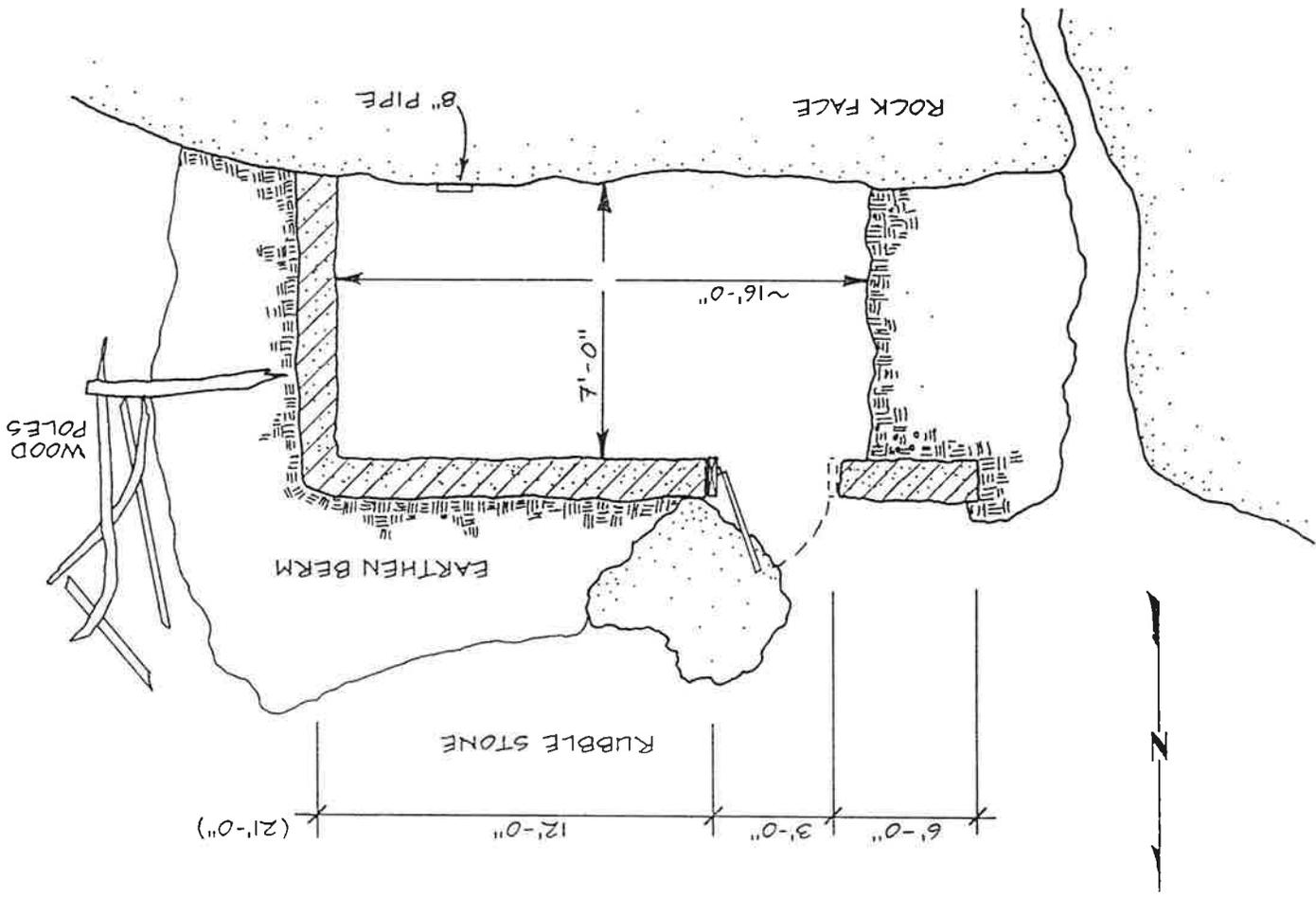
ELM



GARAGE/SHOP (N.T.S.)
 MORRISON RANCH
 (LOWER TRACT)
 SEPTEMBER 1995



STONE DUGOUT/ROOT CELLAR RUIN (N.T.S.)
MORRISON RANCH (LOWER TRACT)
SEPTEMBER 1995



Birch Creek Ranch

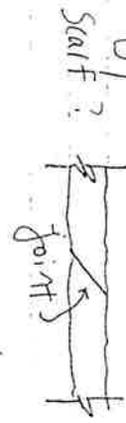
9-5-95

Morrison Ranch parcel

- Root cellar / bankhouse

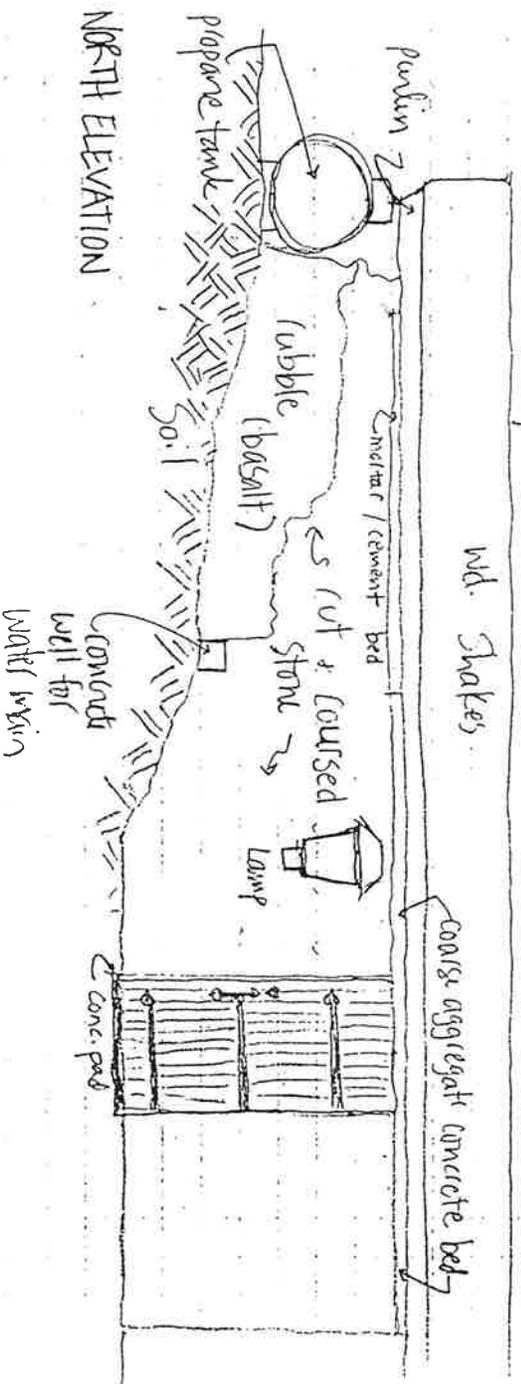
This bldg. was converted into a bankhouse by Martin Rust in 1970s

At that time a new roof system was added comprised of 3 1/2" x 7" polins

raft?  + 5" T+G sheathing, 2x4 fascia, 2x4 blocking, + 5" T+G sheathing, 2x4 fascia, 2x4 blocking, bldg tar paper, + wood shakes. This roof rests on portland cement bed atop masonry walls. Two 50" stacks + two heater stacks pierce live roof.

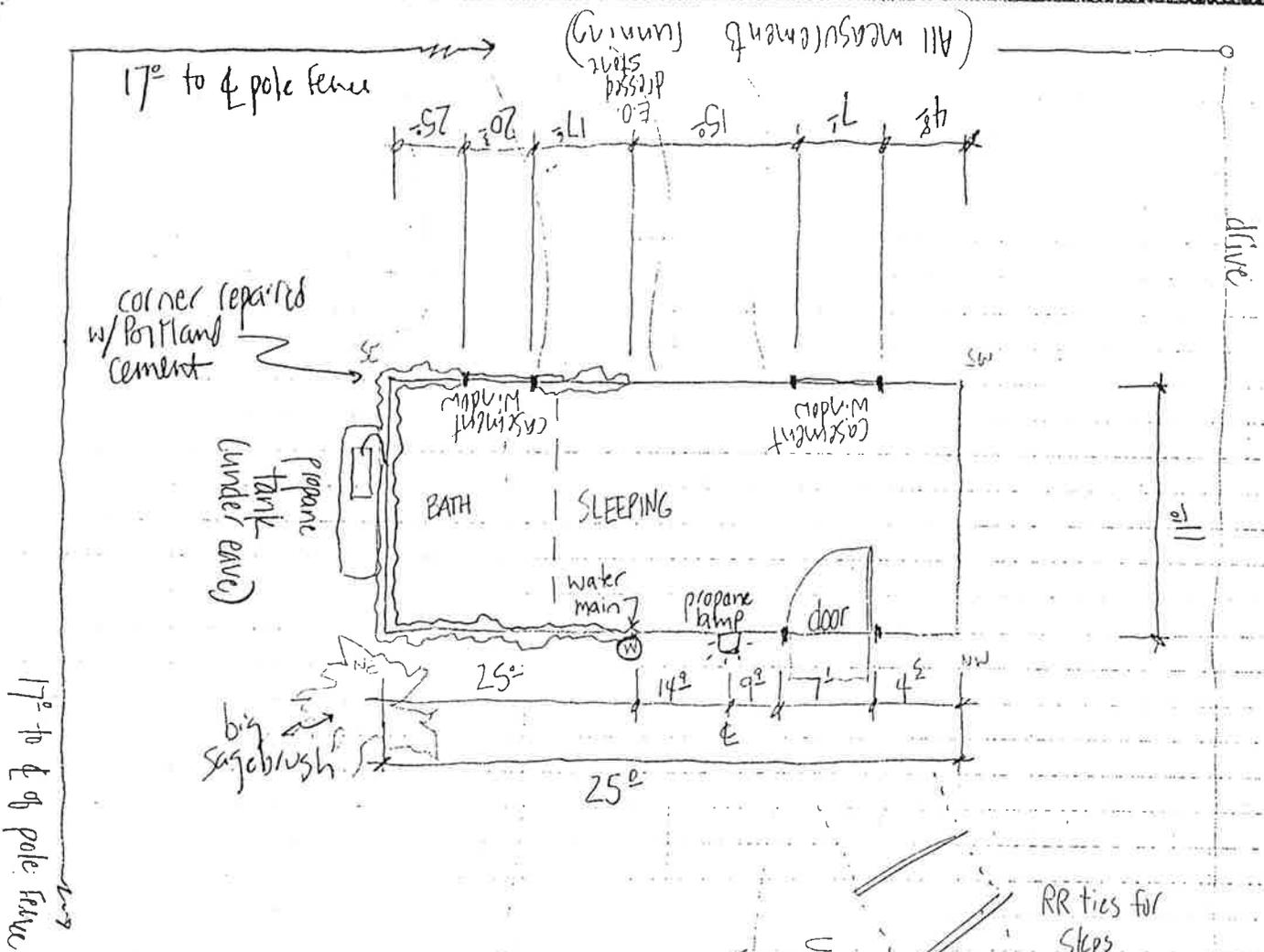
Door constructed of 3" T-G vert. boards w/ "wrought" iron "hinges" + door latch + lock. Standing aluminum threshold + 2x4 framing.

Some feathered cement used to fill in gaps between framing + masonry wall. This was likely original opening of cellar because the way the masonry units are cut.



Notes:

Repointing was done perhaps c. 1950 w/ Portland-type cement w/ sand. Very small aggregate to about 1/3 of elevation from west to east. Rest masonry still has original mortar (fine silty ^{orig} local procured). H-wall needs to be repointed, especially in area of rubble w/ no mortar.



(All measurements running)

17' to E pole fence

corner repaired w/ Portland Cement

propane tank (under eave)

max. m. cement

max. m. cement

BATH

SLEEPING

water main

propane tank

door

big sagebrush

17' to E pole fence

drive

RR ties for steps

uphill

N
↓

2 ft. eave overhang all around

courses	basalt	tuff/rhyolite	walls	10-12" thick
rubble	basalt	basalt	walls	12-15" thick

7

Birch Creek Ranch Photo Log

B&W

DATE	ROLL	FRAME	AZ / DIRECTION	SUBJECT	
9-5-95	1	0	170°	(NW) Root collar/bunkhs - Morrison	
		1		SE	
		2		SW	
		3		NE	
		4	2 →	N wall	" detail of different masonry types
		5		"	masonry or mortar detail / SE corner
		6		E wall	mortar detail - need for repointing
		7		"	previous repointing
		8		N wall	Window detail
		9		S wall	no. system / eave detail
		10		W wall	
		11		SE	Garage / shop
		12		E wall	"
		13		"	detail of cow head
		14		S wall	detail of moisture damage
		15		"	"
		16		N wall	shed addition interior
		9-6-95	35	17	
18				19	
19				20	
20				21	
21				22	
22				23	
23				24	
24				25	
25				26	
26				27	
35	Birch Cr. paved (Upper Tract)	27	100°	digout ruin	
		28	E wall interior	masonry detail	
		29	N wall "	dressed stone detail	
		30	N wall, NW corner	detail of door	
		31	NE corner	digout ruin	
36	Tack Rm. - W elev.	32	220°	" context w/ main living area	
		33		aerial views of property	
36A	Tack Rm. - SW corner	34	210°	digout ruin - detail of "	
		35	N wall (NW)	8" p.p. cemented to rubble wall detail of coursed rubble	

Lower Tract - Morrison Ranch

Morrison cellar (cont)

have created pockets + entries into bldg. (as attested by amount of droppings). [Check to see if masonry contact w/ soil is a problem.]

Door is in good shape, w/ some weathering. May want to air this. Roof membrane in good shape.

East wall - Remortaring wall is in order for areas that have weathered. Again there is some rodent disturbance, but not a problem. Mortaring where needed will take care of this.

SE corner was patched w/ improper material - not very well done. It has remedied the problem, but is not very aesthetic. If restoration by the board is required by SHPO, this needs to be scraped out + re-mortared using appropriate historically compatible material. A masonry expert can analyze historic mortar + reproduce it.

Roof system in good shape.

Propane tank + pipe not a problem - They are painted to blend in w/ materials.

South wall - Remortar $\frac{2}{3}$ of wall masonry from east to west using like material. Similar situation w/ north wall - Portland-type cement was used for repointing probably, c. 1949-50. This is mostly in good shape.

Windows all in good shape - easternmost window sill should be cleaned + swept free of accumulating dirt/soil.
Roof OK ✓

West wall has been all repointed w/ Portland-type cement. Looks OK for now, but should be routinely inspected for cracks + deterioration of mortar.
Roof OK ✓

Comments - no identifiable structural instability + all walls appear to be solid + plumb. No water damage, rot, or insect damage in wooden members + details. Some minor weathering has occurred + should be routinely inspected for severe cracking, splintering of wood.

Wall Thickness = 10-12" cut stone 12-15" rubble

No thermal/moisture cracking, no freeze/thaw cracking, no structural failure, wall bulging, wall leaning. No fire damage.

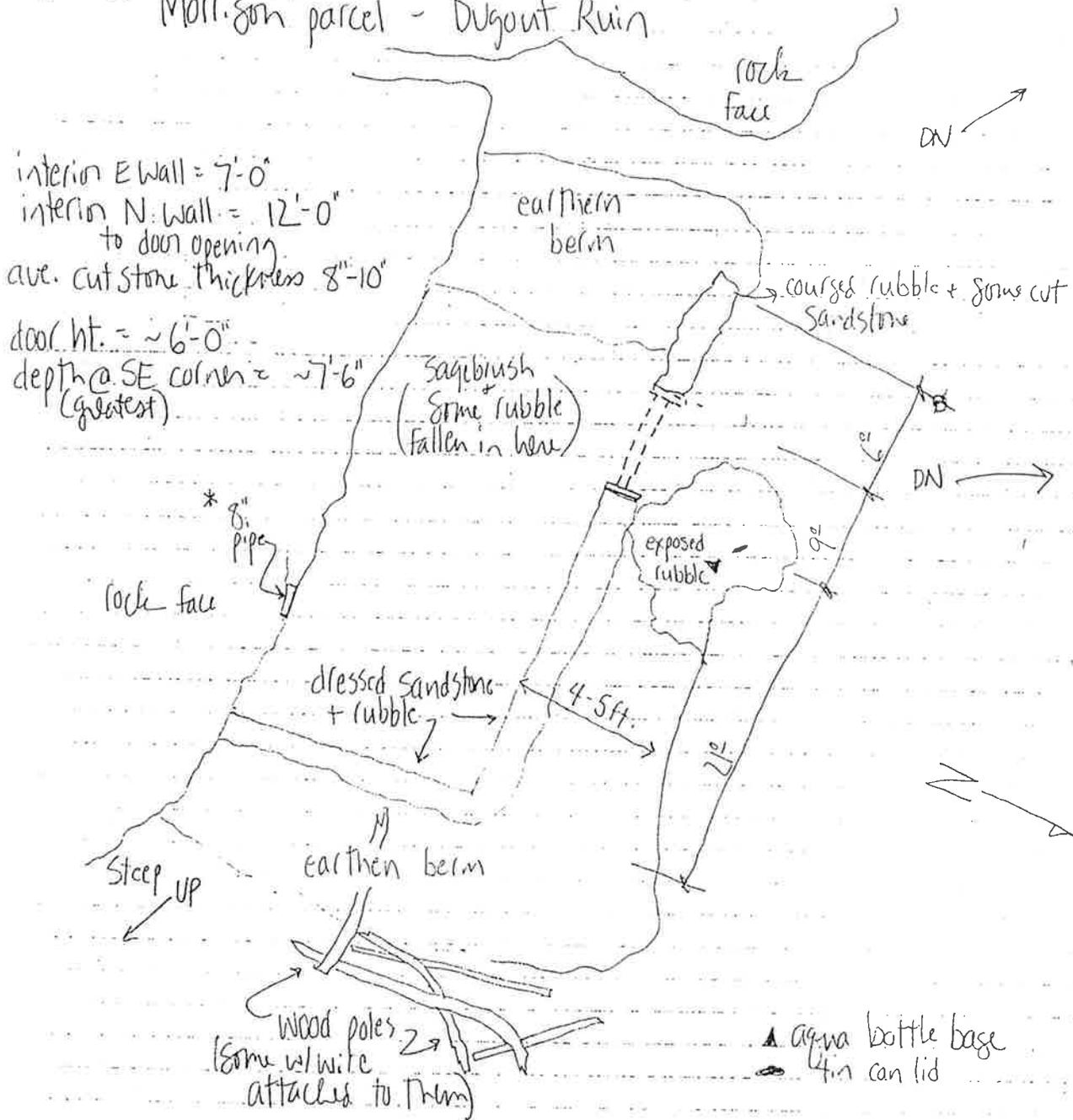
No chimney or stack problems.

Purlins are 2'-10" o.c. spacing.

INTERIOR = West wall shows cracking (vertical)

9-6-95

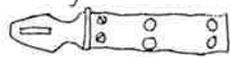
Morrison parcel - Dugout Ruin



* 8" cast. iron pipe section is cemented into rock face. Does not function as a stove pipe; perhaps some sort of vent.

Very cool + somewhat damp spot. There is some moss growing on rock face where ground surface meets rock.

Door is constructed of 3" T+G vert. bds. w/ X-bracing on inside. Iron hinges and strap type + utilitarian door latch



Put together w/ wire nails. Door framing is bolted in to cut stone (anchor bolts). Door is very deteriorated, but salvageable.

9-6-95 dugout (un cont)

If replacement is recommended by SHPO if dugout is planned to be restored, exact construction + detailing is required. The framing may be the only thing necessary to replace.

Stabilization of cut + rubble stone walls is recommended.

Restack stone + shore-up door. ^{at least} Roof structure + materials * Not-known, but could have been poles + shingles. Some shingles are stuck in a crack in the rock face just above 8" iron pipe.

CAUTION-

There may be historic artifacts in situ around this feature. A bottle base + tin can lid were found.

Clean out inside of structure (weeds, vegetative debris)

Repoint masonry w/in-kind mortar. It is of similar nature as cellar-bunkhouse at Morrison headquarters. — IF WARRANTED

[Find out what pipe was used for.]

67 paces from dugout to pole fence in front of garage/shop. Dugout (10 1/2 paces = 50 ft.) ~400 ft. ruin is due east of garage/shop.

Signs of cows being around structure.

* Paul (caution) said an informant + previous owner George Wright said roof was collapsed by milk cow who fell through + got stuck inside structure. Said roof was of boards w/earth on top. Structure may have housed a still at one time. For purposes of this report, it is designated as another root cellar.

63 p : 300 ft 7p.

10 1/2 p : 50 ft. 5p.

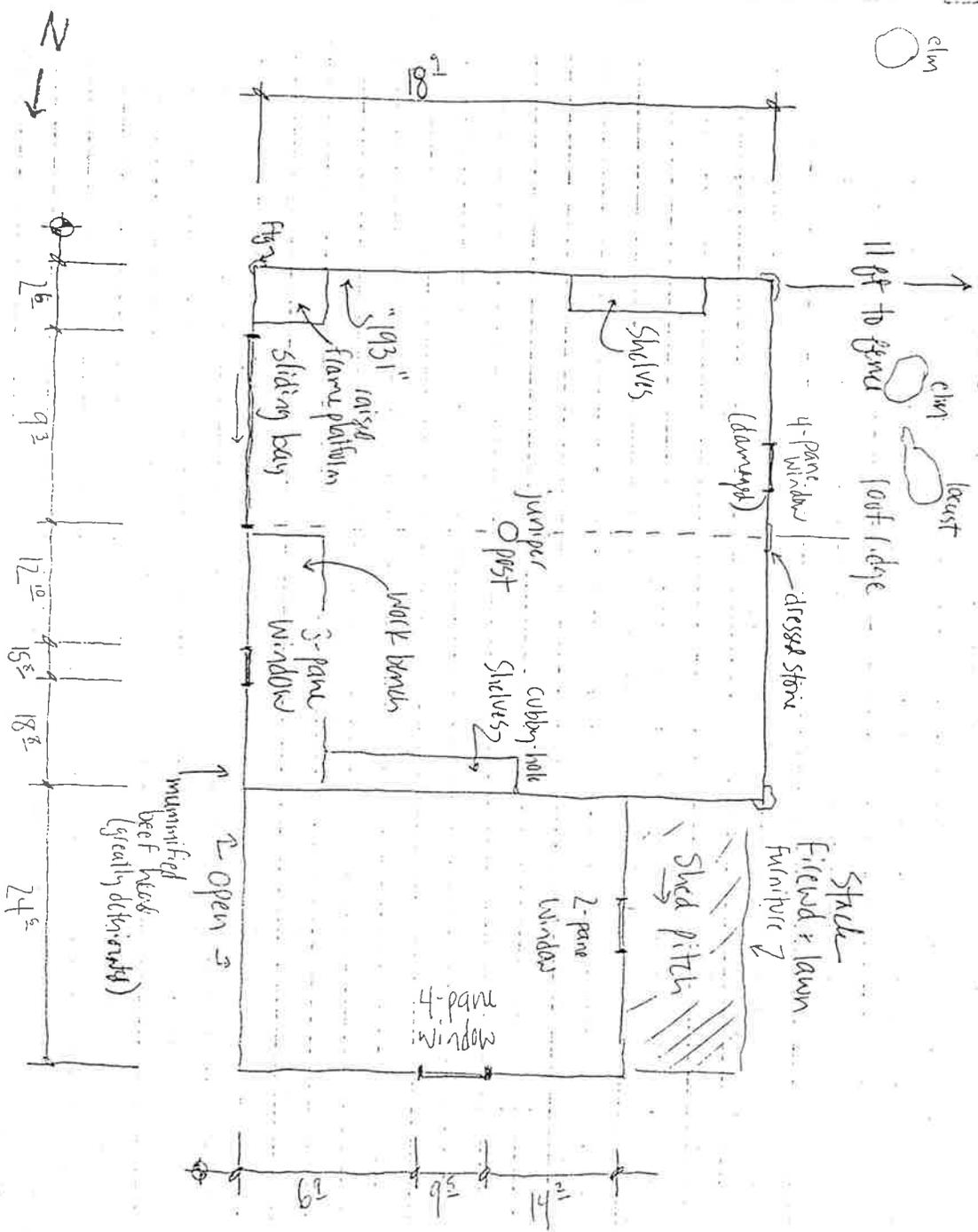
67 p :

#10

17-18

22

9-6-95 14011 sqm parcel Garage/Shop



Bldg. was clearly constructed from material recycled from other structures no longer standing at the ranch.

Main garage is framed w/a variety of lumber, incl. 2x4 corner posts, 4x4 posts, 2x4 girts, 4x4 top plates, 2x6 cross (sway) braces, 2x4 rafters @ 28" o.c., 1x6 slip sheathing @ ~28" o.c., carrying metal roof, 2x4 diag. wall bracing, 1x12x5ft vert. siding, apron from ground to girt + girt to top plate, 4x6 sills, + stone pier footing. One juniper post is in the middle supporting 2x6 roof/diag. locust? DIRT FLOOR

There is a work bench along E wall at NE corner ending at bay opening. Shelving exists along N walls from NE corner ending at center of garage. This is of newer construction. Other shelving exists

9-6-95 Garage/Shop movement (Cont)

Gable front removed w/
front eave gutters + bce head

9 on South side. Old horse truck, irrigation hardware, pulleys +
other olden shop hardware are hanging on the walls. BLM is using this
bldg for fuel + tool storage.

~~see the weather
hits this side~~
★ The bldg. is in good structural condition but the exterior Siding is
quite deteriorated, especially on the south side. This may be the
result of sprinklers for the lawn hitting this side of the bldg. The lower Siding
lets from the girt level to ground are severely cupped + water damaged.
Lichen growth is abundant + the bottom ends where they are attached
to the sill have rotted. The top 1/2 of the Siding from the girt to the eave
is not in as bad shape; still some bad are warped from moisture.

A 1x8 piece of blocking underneath sill from SW corner along South
side (siding covers this) is in poor condition due to rot from
excess moisture. The sill appears to be O.K. + foundation piers O.K.
but dirt/earth has packed up at bottom of the 1x8 + Siding boards.
The earth holds in the moisture from lawn watering + creates a
moist env. conducive to rotting wood rot. This should be cleared/shovel
away from all wooden members + an air space opened for maximum
ventilation. South Siding should be replaced with 1x12 x 5ft+ pine
boards, 1x8 should be replaced (can use pressure treated members
since this piece is hidden).

West wall Some bds (siding) are cupped or bowed + warped.

Replace these as above. Foundation piers in good shape except for
NW corner where a wooden block has been used to level this
corner. It is no longer doing the job + should be replaced w/ another
field stone. Jack up corner slightly + inset stone. Clean away all
accumulated earth/debris along base of this wall + create
an air space for ventilation. Firewood + patio furniture stored in
this corner should be removed. The firewood encourages rodents +
damaging insects.

Old 4-pane window (sides) very deteriorated. One window gone + only
one pane complete + one panel. The other two are gone. They were
recycled when I went to find a similar window for replacement.

9-6-95 Morrison Garage/Shop (cont)

This window doesn't even fit the opening anymore.

North Shed addition - Framed w/ 2x4 studs over ShipLap Siding. 2x4 girt, rafters, & 1x8 Skip Sheathing. Wood Shingles. 2x4 Sill plate, looks like it sits directly on ground. Too much dirt from floor outside piled up over foundation. Clean this away.

All materials recycled. West window (2-pane) is missing original glass. One side has a single pane in it from a 4-pane window. Could replace glass. Sash pins still in place. This window slides up.

Window on north side is 4 pane, 2-panes of glass are gone. This window slides up.

Shed is in fair condition. It is not entirely structurally sound, but also will not fall down immediately & poses no danger. Shed has helped preserve north side of barn. Wood shingles in roof, however, have a good bit of lichen growth & many are missing. There are too far gone to save - replace in kind, but may want to replace portions of shed, too.

East wall Clean away accumulated dirt from foundation. Bottom of some siding is rotten but OK. Keeping dirt off of bds. will help prevent additional deterioration.

3-pane window slides to the side. Panes need to be glazed + one pane is cracked. Sill has come unsealed. Put this back. Sliding door is in good operating condition. Some bds. are cupped, but sound.

Interior dirt floor should be leveled + cleaned away from foundation.

Could shore up shed addn. to stabilize it structurally w/ corner posts.

Rich Creek Ranch Photo Log

B&W

DATE ROLL FRAME AZ/DIRECTION SUBJECT

DATE	ROLL	FRAME	AZ/DIRECTION	SUBJECT
9-6-95	2	0	SW corner	Rich Cr. - Take H3
		1	NE corner	Findn. detail SW Take H3
		2	W side	interior door detail Take H3
		3	W side	Take H3. elev
		4	"	" detail of deteriorated wall structure + dirt bank up to it
		5	E+N	Generator shed
		6	W+S	"
		7	E elev.	"
		8	"	contxt " w/ pond (or RA photo)
		9	N elev.	generator shed + detail of deteriorated SW corner
		10	SW corner	detail of deteriorated SW
		11	E elev.	back deterioration "
		12	E+S	view of Rich Cr. + trail
		13	E+S	chickens "
		14	E+N	"
		15	E	" detail of barn
		16	W	" still deteriorated - interior
		17	N	" interior view of detail
		18	W (stair) + S	chickens + generator
		19	Small, near SE corner	" fence structure - interior
		20	SW corner	" SW deterioration
		21	E elev.	Barn
		22	W elev.	"
		23	S	" detail of door to kitchen
		24	W elev.	"
		25	N	" detail of door into + newspaper
		26	N	" detail of food change
		27	N	" detail " (right)
		28	N	" interior
		29	kg. S	loading chute
		30		overview of corner
		31		interior
		32	W side	interior

cont on p. 25

795

Birch Cr. Parcel - Tack House

9-6-95

Physical Construction

2x6 fl. joists = K5T-6 fl.

Shear-roofed bldg set on dressed timbers - inside show footings

Framed w/ 2x4 studs + rafters, no exterior siding, but interior is sheathed w/ 1x5 horiz. bds. Roof is sheathed the same. Several pine

Alber tobacco tins (flathead), tin can lids + small pieces of sheet metal cover knot holes from the inside. The floor is plywood. Roof is w/ shake

bldg faces covered + opens into covered. Down constructed of 1x3 vert. bds + 2x4 horiz. nailers w/ on dia. 2x4 brow. 4" dia. Sapling sections (3) are

blg. is in poor condition. It is leaning to the east. Sides most exposed to prevailing winds (south + west) are the most deteriorated. Studs

are not functioning because of deterioration. They have been anchored to 2x6 sill w/ iron hangers plus are bolted to sill but their attachment

is not satisfactory. On south side the studs have little structural integrity as brace diagonally. (See photo)

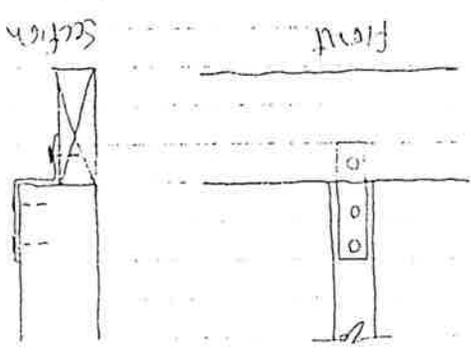
Back rats are a problem inside. Bldg. The roof floor, this area is submerged. Details has collected insects. This structural

that needs to be cleaned out. Dirt is in gutter w/ sill members on the south side is at a level about the floor. All this needs

to be cleared from bldg. + air space ventilation. Maintained. This bldg is in 2x6 slope so far as the walls are concerned.

Floor is level. Joists are in good shape. Sillies are in good shape. (See photo) suggest stabilizing the walls + applying Sevin for

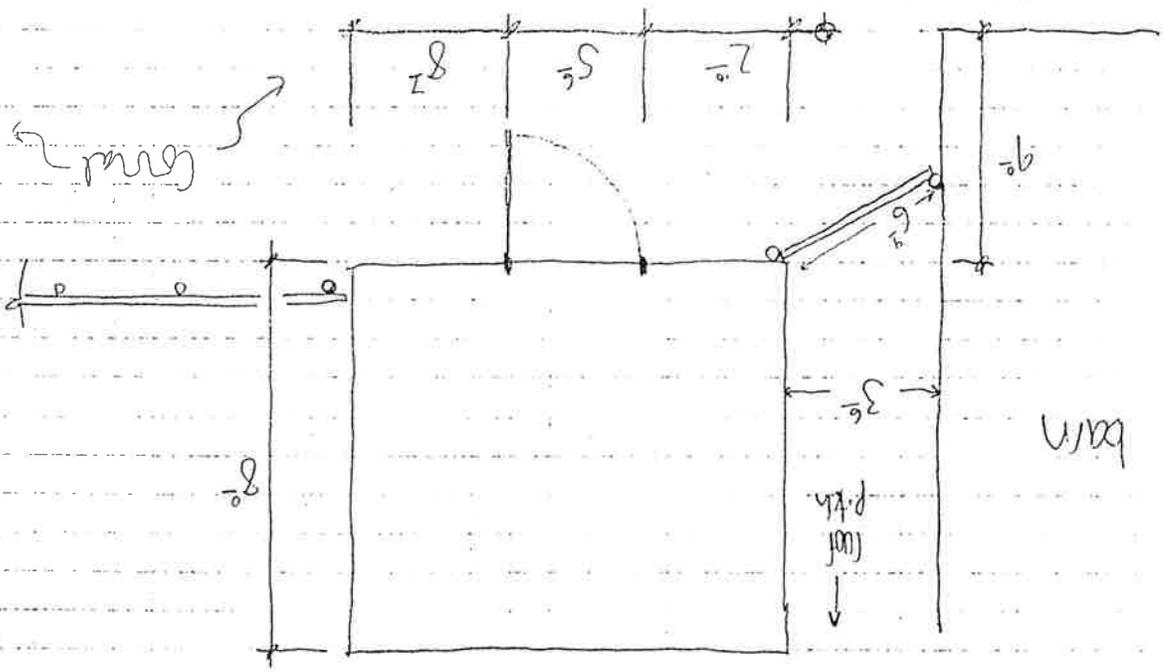
damage structural members w/ used pine lumber. Trap things down the facing side.



Flood waters covered this bldg. up 4 feet. Paul Strickland it. Needs a new fndtn, so he says.

COMMENTS: May try to brace this structn by replacing corner posts + adding new diagonal bracing on the exterior. This will save the walls + their stability. The structn. Routinely clean up and/or trap rodents + their droppings.

Bldg. looks like it was constructed from recycled materials. not, perhaps, very wise.



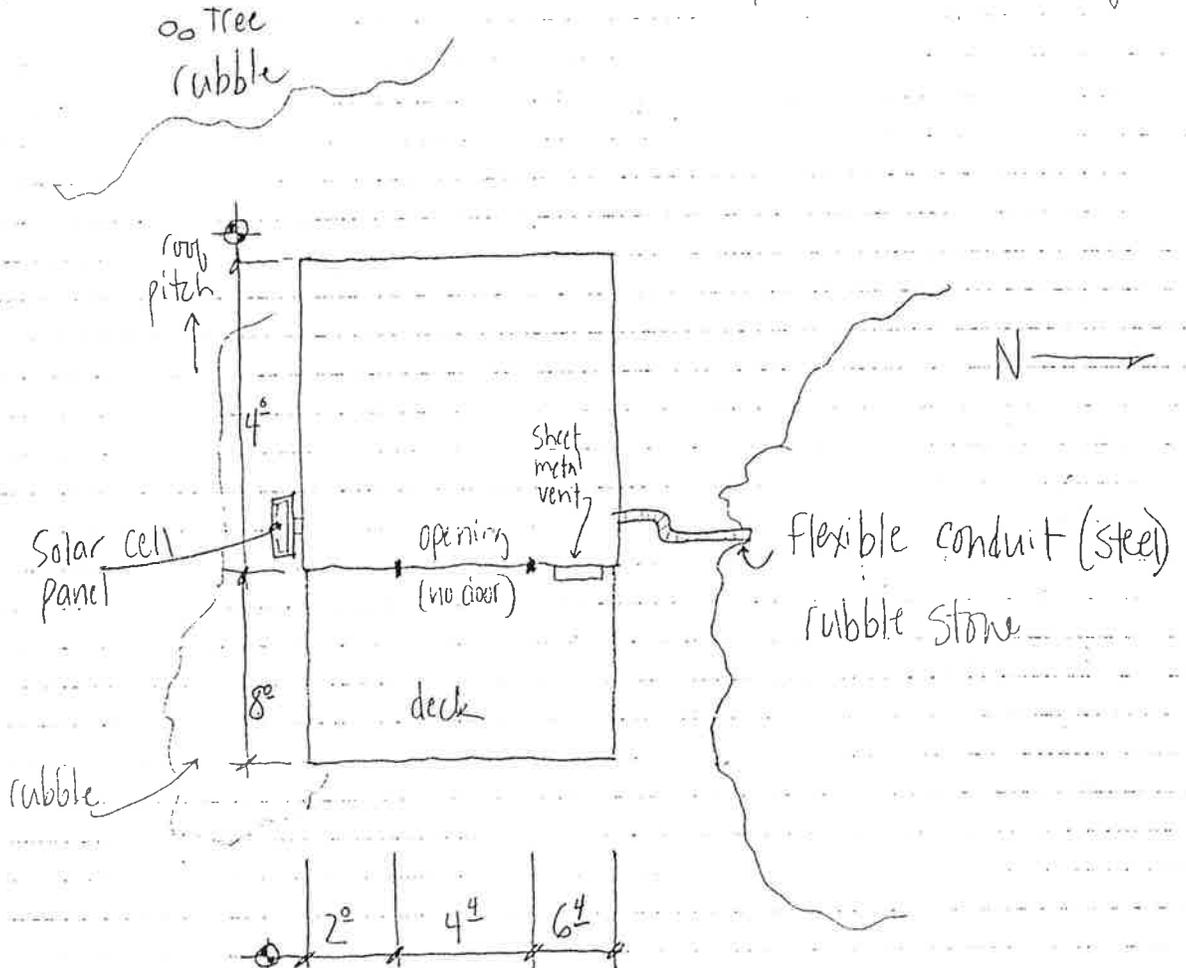
==>

door is 6'-3" high

9-6-95 Dr. W. G. - Take Hts. (cont)

9-6-95 Birch Cr. parcel - Generator Shed

Structure faces East + is associated w/ several water convergence features.



Floor + deck are 2×8 's ^{+2x6's} on 4×4 joists resting on naturally occurring rubble. Shed is 1×12 B+B w/ 3 " beaded T+G roof sheathing, asphalt comp shingles + wood shakes on top of that.

Shed is 6 -ft tall @ highest ^E + 4 '- 8 " @ lowest ^W heights. There is a 3×10 plank laying on roof. Floor planks rest on 3×10 sill @ west end that is failing + is partially rotten. (See photo)

Some planks on deck are rotted. Rotted portion ~~(deck in this)~~ should be cut out + replaced. Sill on west side (load) should be replaced. Shed should be free of dirt bldg up on the outside of walls. Clean this out + create air space. Where generator conduit comes out of wall on N side, oil has spilled on bds. OK

Another example of making use of what materials are available. Shelving

9-6-95 Generator Shed (Cont.)

inside is old Sorker and seems O.K. Some of floor inside is old Sorker. Floor is a little spongy in the middle.

This shed may not be all that old. 1950s?

Shed houses generator + batteries.

Tree behind shades west + south + north sides.

Shed is located at edge of rubble pile that is thought to have been Lamborn shed. Pond is 25 ft off NW corner of shed.

Pond holds water + is fed from 8" illig. ditch uphill + is drained by 12-18" ditch downhill that runs parallel to ground.

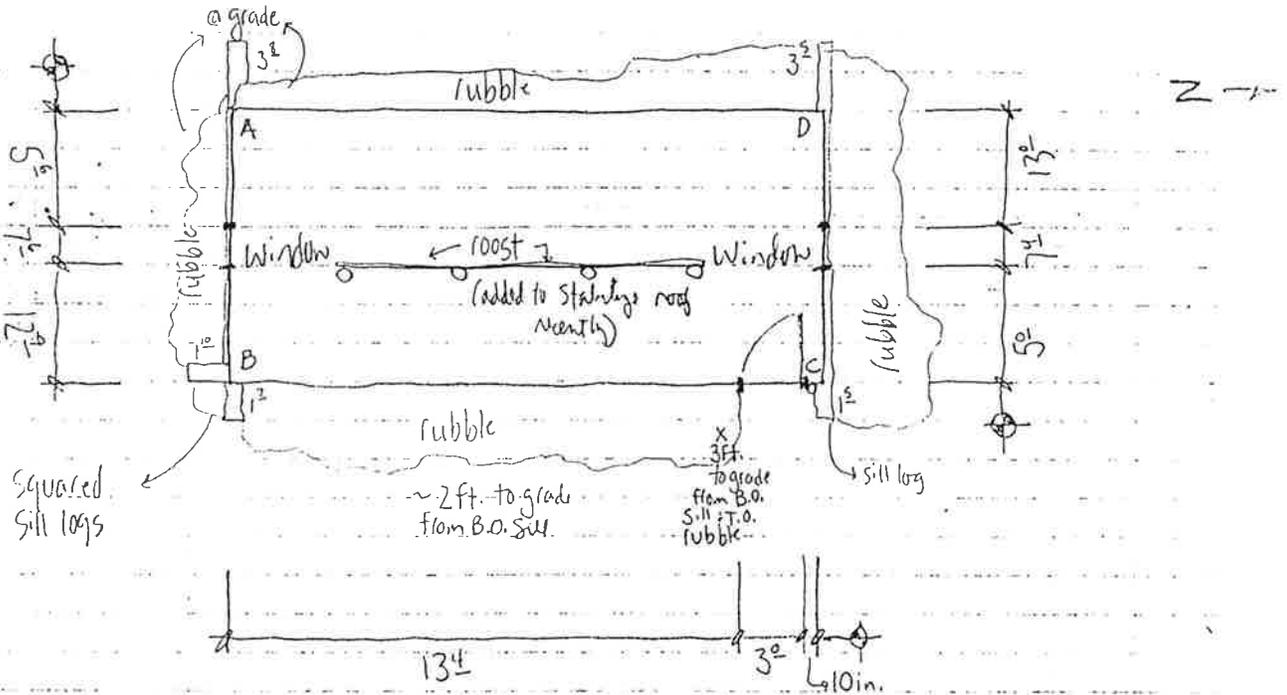
[Probably built by Monty Rust] - Paul Kamo confirmed this.

9-7-95

Site G. parcel - Chicken House

West (back) height = 2'-6"

East (front) height = 5'-0"



- A 2'-7" T.O. rubble + B.O. sill
- B 2'-10" "
- C 2'-5" "
- D 2'-4" "

Chicken house is partially dugout (South, SW, SE) + partially @ grade

From the interior dirt floor there is ~ 2 1/2 - 3 ft. of rubble stone squared cut

inside, but piled on the outside. Massive squared (sawn) 10" x 10" logs form sills on N + S ends, 7 x 10 is east sill, + 5 x 5 + locust log ~ 5" dia form west sill. The

N + S sills extend out from structure from 1 1/2 to 3 1/2 ft. + are notched (sawn) to accept E + W sills. The rubble is in fine shape, being stable by earth all around. No apparent buckling or bulging is evident.

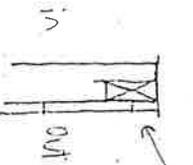
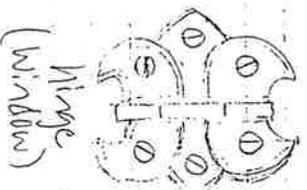
The sills, however, are all deteriorated (S is in a little better shape). This can be best detected on the interior of the bldg. Deterioration is mainly from moisture (snow + rain) + the wood's contact w/ the ground since soil has packed up between rubble + sills through time.

9-7-95 Chicken hs. (cont).

The walls are framed w/ 2x4s using bottom & top plates & studs. The bottom plate on E side in particular is greatly deteriorated. Nail holes in this lumber suggest it was salvaged from another bldg. used in the construction of this structure. All other 2x4s salvaged, too. Studs on this side have little integrity & are cracked & buckling. Top plate seems weathered, but fine.

South side sill is rotten on top in several places especially @ SW corner. ~~There is clear evidence of water damage on top of sill~~ ← NO - reflects old damage by moisture & weathering.
? but this may all be result of rain-act'd problems. SE corner, bottom of sill. Bottom plate has also (no sign damage) exp. SW corner. Studs seem OK. Window sash is missing and but the weathered part the hinges are attached to. This window portion of the sash has horiz. bds. nailed (spread) across the outside.

One stud near SW corner was an old log that has been cut. The tops of all studs are notched to hold a ribbon or girt plate.



(least?)

West side log sill has become slightly distorted (shifted) - some ~~old moisture damage~~ is evident at N end of log. The other part of the sill to the NW corner is a wedge log ~~that is not~~ That is not very secure. Hinges seem solid enough.

but could be wedged in better. This entire sill could be set better & more securely. Not 100% apparent in bottom plate, however. The condition of the sill has caused this wall to sink down towards NW corner. Top plate has deflected under. This shift of weight?

North side sill is rotting on outside exposure bottom before snow moisture has to build up & get trapped. The wood here flaked off. The entire exterior-exposed portion of sill is badly rotted, & in one spot, almost all the log is missing. Anchor bolts are exposed. Bottom plate is covered by vertical siding, so exterior protection is fair weather.

9-7-95. Chicken hs. (cont).

ENS

Walls 1x12 + 1x5 horiz
+ W wall combo T+G + 1x12 vert.

North side studs are warped under load of roof + are cracked. There's nothing left of the window sash, but hinges are still intact. Top plate is cracked near NW corner. Dirt has accum. in NW corner floor, possibly from rodent disturbance.

2nd Roof rafters all need to be thoroughly braced or replaced as does roof sheathing. Rafts are 26" o.c. all are bowed + cracked w/ little structural integrity. Sheathing is variable - 1x12s, 1x5s - most need replacing. Remnants of asphalt comp. shingles make up roof covering. Replace in-kind.

There is a roosting structure inside that is supporting roof. These are 3" poles w/ 1/2 poles nailed horiz. They rest on fieldstones. No brooder houses are left, but front door has a top-hinged chicken door. Hinge is same as windows. Door constructed of 1x7 + 1x9 vert. bds. w/ 2x4 cross pieces nailed to framing w/ standard strap hinges. Chicken yard is non-existent.

Comments: masonry walls are stable. Wood framing is deteriorated/structure is stabilized for now, but is subject to collapse. Wall structure would not support a new roof. maybe put posts in 4 corners?

East side is open w/ chicken wire

N,S vert. shiplap siding + plain bd siding 8"-12"

W horiz. beveled shiplap.

Clean vegetation off rubble stone on outside. Grub some of the Sagelers from east side.

Sill pieces from a "rook boat" used as a sled to haul rocks to build fences with. (info from Paul Kraso, BLM ranch caretaker)

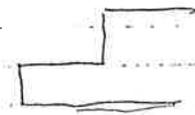
★ This chicken house is likely not that old. After the 1940s.

NE corner of barn was taken out in floor. The entire north side of the foundation is undermined, exposed bed of gravel on which foundation sits in. Upstairs. NE corner rafters have been strengthened by cross braces (collar beams) recently. Floor has also been recently supported by two 5" dia. poles w/ 3x5 horiz. brace nailed to poles. This is supporting 4 floor joists, but is

Condition/Modifications

Take room seems to be a recent addition / use of this space. New lumber & nails are visible. The work of Rust? The outside. Foundation appears to rest on a bed of gravel. There is a water table separating the two levels on the mechanism or any evidence that there ever was a hay hood, but no opening on N side. No hay

- 1x6 sheathing w/ corner brs.
- 1x6 shiplap horiz siding w/ corner brs.
- 3x13 flooring (N-S)
- 2x12 (E-W)
- 1x6 ribbon (E+W)
- 3x4 studs



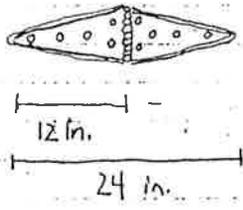
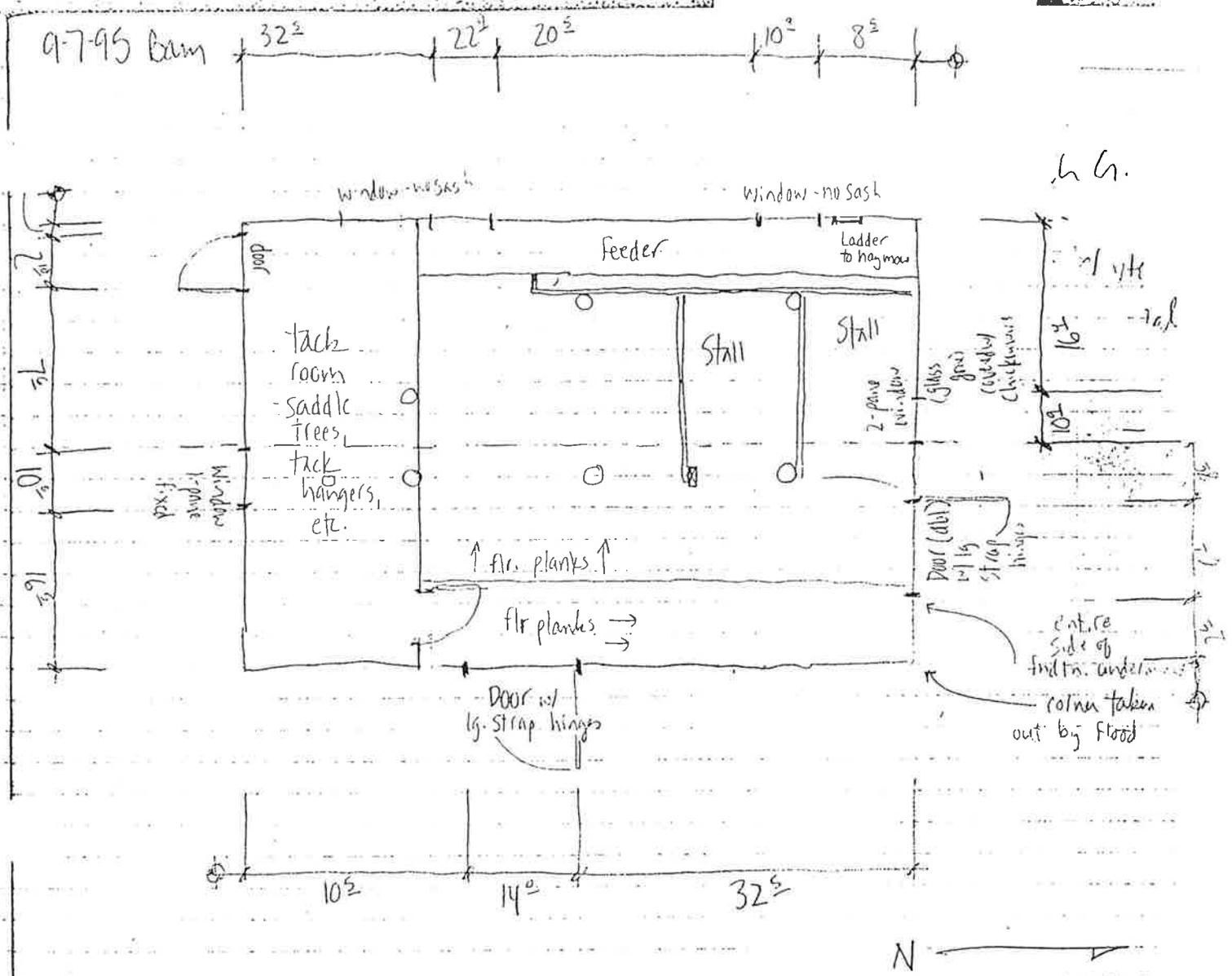
main level - dressed stru (courses) covering foundation w/ cement bed 5x5 saw, lap joints & nails

- Various skip sheathing w/ 1x6-1x12 wood shakes over water shingles
- newer 2x4 cross braces on each rafter
- 2x4 ribbon (N)
- 2x4 rafters 24" o.c.
- 1x7 horiz. wall sheathing
- dbl. top plate of 2x4s
- 3x4 studs 24" o.c.
- 2x8 gl. posts w/ x bracing
- 1x5, 1x6 tie
- fire.

balloon framed

harrow level - 3x4 studs 24" o.c.
Birch s. panel - Barn

Physical construction



not very stable & is easily moved off track.

No structural member is rotten though & barn is very sturdy. Roof is in good shape - no apparent

leaks. Juniper posts are bolted onto floor joists above. Some buckling has occurred in lower floor, but floor is solid.

Another add-on 5" post in tack room is not attached to floor joist above. Nail this securely. Joist is not even resting on post. In tack room, floor is bowed (lower in middle) but still very solid.

There seems to be some settling of the structure, but not bad. Tack rm. south sill shows displacement & some rot from contact w/ soil. (~~possible post beetle?~~) Area of this is right in middle of wall. Outside

9-7-9. barn (cont) 9-7-95

Shows
hammer wall is buckling from ground up outward. Sill is very rotten @
+ this point + has buckled off of foundation. Repair sill hwo.
ie. Clean off dirt on outside of foundation (it's covered a portion
balloon in of it.)

Only sections of sill may need to be replaced. You'll know once you
start repairing sill.

Barn was once painted red x N side in good shape

W side - clean off foundation + removed all grass to expose fndth.
Lower 2-3 horiz. Siding bds. could be replaced (but not absolutely necessary
partially gone. Hammer door is 1/2 missing. Window sash on both
lower story opening is completely gone. Window sill is missing from
northernmost + part of window sill missing from southernmost.

Exterior examination shows deterioration of west sill in spots
where it has come in contact with fndth. + dirt piles up
on fndth. Actually, this is evident all along sill. Severe rot.

South exterior suffers worst weather, Siding is most weather-
beaten here. SW corner bowed outward to the west. Check fndth.

Sill ok on north side

E side - clean soil from fndth. Bottom 2-3 lws. ext. Siding could be
replaced - but OK.

Interior west wall along feeder - clean out soil accum here
on inside. This is what's holding in the moisture + inviting
rot. Entire interior should be cleaned out. Lots of
rodent debris.

Floor not tied into rest of structure. There was 4 feet of width in here during
flood + barn was damaged as noted above, but because fndth wasn't
tied to structure, it didn't float away.

Birch Creek Photo Log

B&W

DATE	ROLL	FRAME	AZ/LOCATION	SUBJECT
9-7-95	2	32	SW	Barn @ Birch Cr.
		33	S elev.	"
		34	N+W	"
		35		detail of Squeeze chute
		36		loading chute in corral
				bunks/Shop
	3	1	E (front) + N	"
		2	"	"
		3	E elev. (front)	"
		4	S elev.	"
		5	N elev. (side) + W (near)	"
		6	W+S W+S	"
		7	E (front) door E (front) door	"
		8	S	Siding (fill determination)
		9	N	" fifth detail
		10	E (front) + S	rootcellar
		11	mostly S w/ some E	"
		12	N elev.	"
		13	W elev.	new roof
		14	E	rootcellar - dbl. door
		15	E	" incompatible repainting
		16	N	" window detail - "
		17	W elev.	outhouse
18	S + E	"		
19	W	" detail of Seat		
20	N + E	cistern		
21		" from above		
22	E	" showing overflow		
23	S near SE corner	" showing rubble spalling from concrete		

9-7-95 Cistern (cont) ^{probably a replacement}

Lid is in good shape. Pyramidal cap shows no sign of cracking, but does have some lichen growth. Some of the cement coating has chipped off W + S sides (in view the applicator to prevent leaking?) - doesn't look like it was even covering anything.

Cistern is leaking in NW corner, along N side, & very large leaking in NE corner & entire E side. E side no longer is facing W field stones. ~~It is not leaking from the SE corner but out to face chimney and it also goes down into the ground.~~

The E ~ 2 1/2 ft. moisture! Caused these to spill off. Cistern is in concrete is covered w/ water at all times and a thin layer of moss/stone. Excess moisture is bad for concrete. Cistern is in

Out take pipe about 1/2 in cementing into place, but all the wetness is covered this to be loose + cement plug is water saturated.

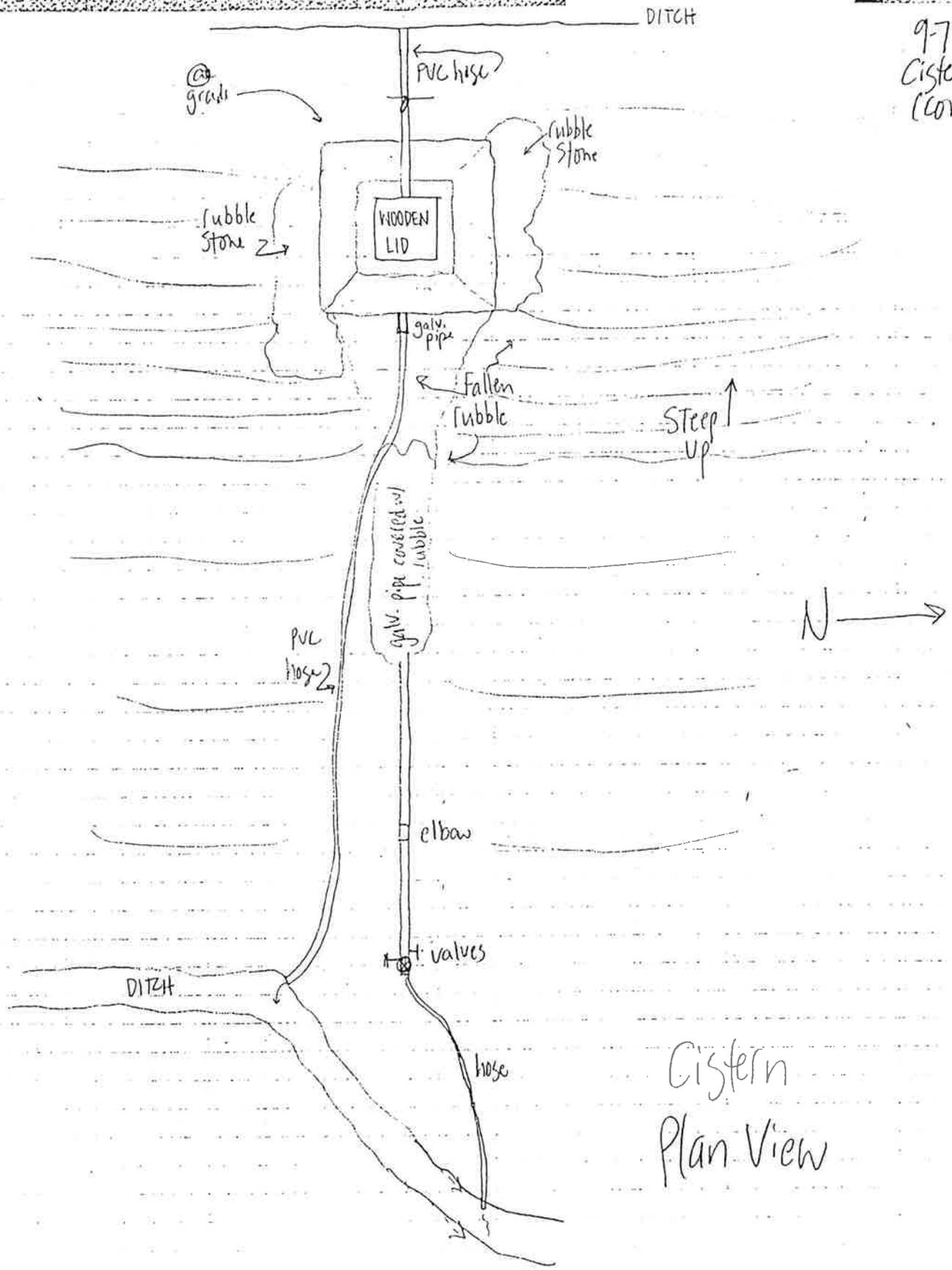
There is no explain cracking in the concrete, though.

[Need to check on concrete deterioration.]

Clean vegetation from S side (berry bushes) which is also leaking on south side. Rubble is spilling off concrete here. ^{clean vegetation - all around}

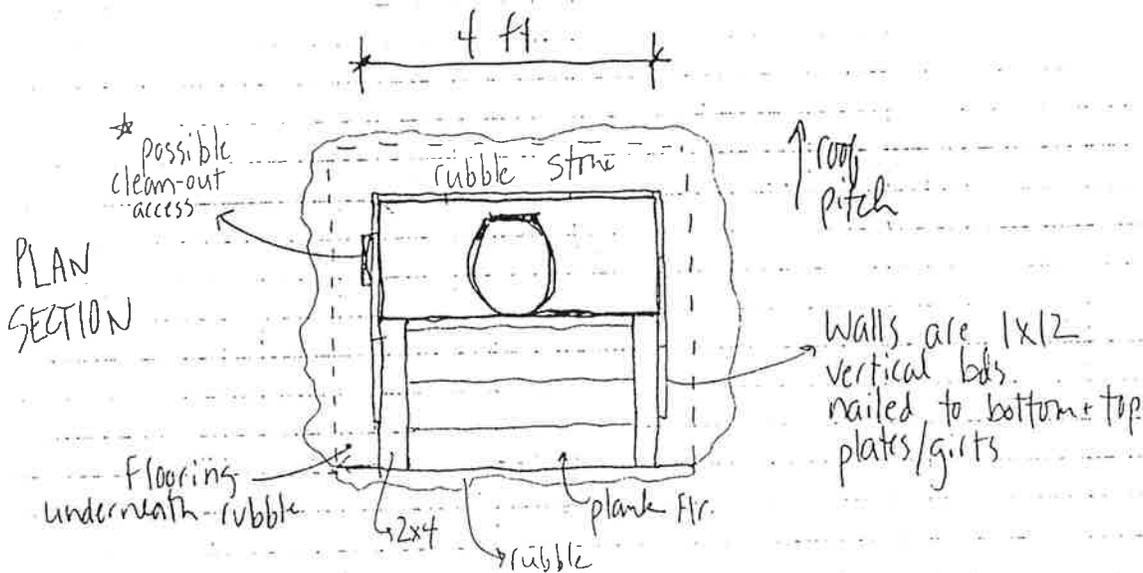
Cracks on inside were fixed w/ Tan + concrete sealant recently. 14 ft. deep on inside + 4 ft. around walls at least 1/2 in thick.

9-7-95
Cistern
(cont)

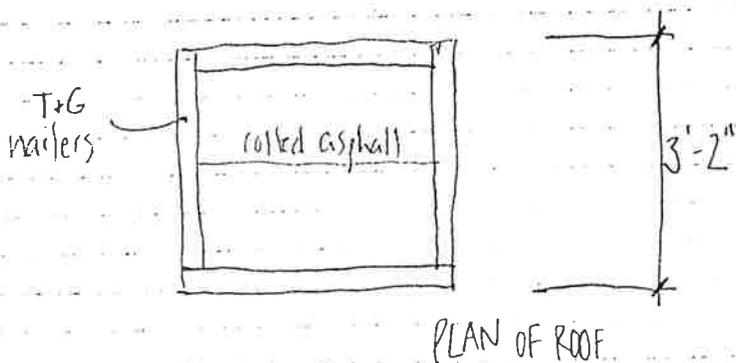


Cistern
Plan View

9-7-95 Birch Cr parcel - Outhouse



Roof is 1x12 planks w/ rolled asphalt roofing + T+G nailers



* Privy may have been cleaned out periodically

One wall board on N side is missing. Privy is painted white. Rubble stone keeps privy fixed. Structure is wobbly, but that's the nature of the construction. It is in no danger of collapse, but could use some basic cleaning.

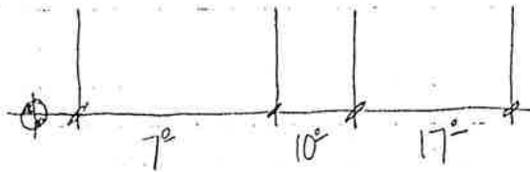
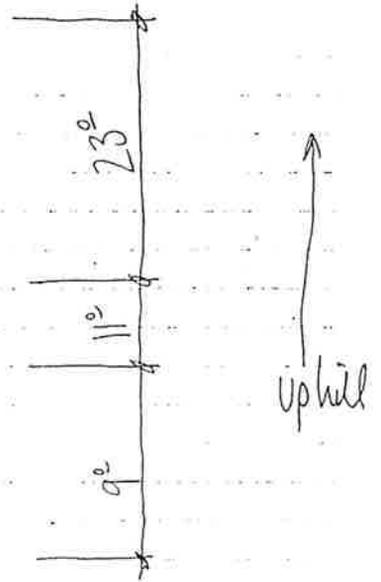
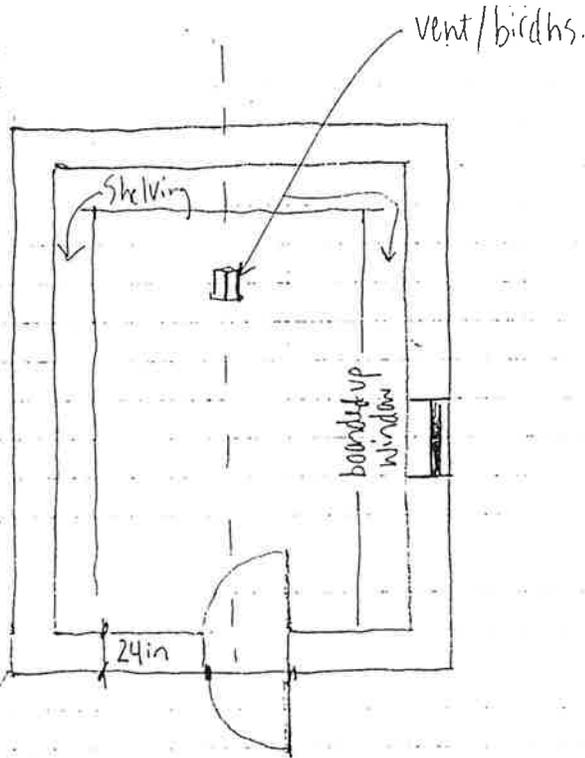
Needs new asphalt sheeting on roof.

9-7-95

Birch Cr. parcel - Root Cellar

old chicken
house
ruin

rubble
stone



front door is stuffed in cracks w/ burlap for insulation against drafts. There is a double door (ext. & int.) w/ air space between.

Maximum height grade to eave (NE) = 6'-6"

Minimum height (NW) = 6" ^{SE}

* Make sure to keep soil from reaching roof wood members on N & S & W sides. Keep clean on regular basis. Entire roof was replaced in kind Sept. 1993. At this time all shelving was replaced in kind, as was roof vent. Passed SHPO approval.

Biggest problem - incompatible mortar (recent work w/ Portland type cement). Historic patching was done w/ compatible mortar - much softer w/ ash or sand base. New patching done w/ harder material - will not fit.

9-7-94

Root Cellar (cont)

give like softer stuff. Base of structure was mortared the same way w/ same hard stuff. Portland cement was also used as bed for wooden roof. Mostly on E side (front)
 On N side - Mortar stays w/in joints; even later historic mortar.

S side is largely covered w/ rubble & soil from adjacent to old chicken house ruin to the south. Portland cement was still used here.

W side only 6 in. is exposed.

No cracks on interior of structure - most all joints have been repointed w/ Portland cement. Incompatible.

[Check on what to recommend for this.]

Structure is solid & in excellent repair.

Some shelves in side have just cleaned. Others entirely replaced. Interior door has been covered w/ black block paper (etc) - is historically compatible.

[See letter report for other details.]

WALLS:

course, dressed stone

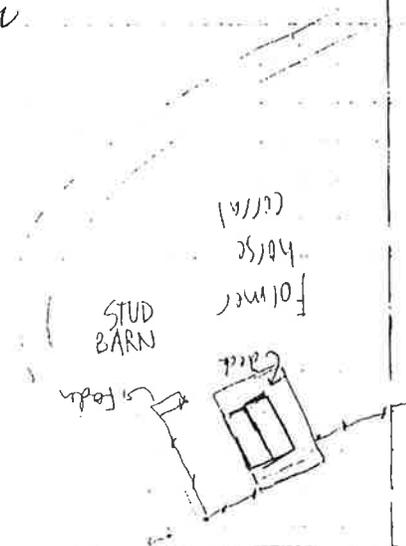
ROOF:

(all replaced)

2 in. dimension top plate + rafters
 1x sheathing
 wood shakes

2x4, as historic

1x interior sheathing for ceiling (T+G?)

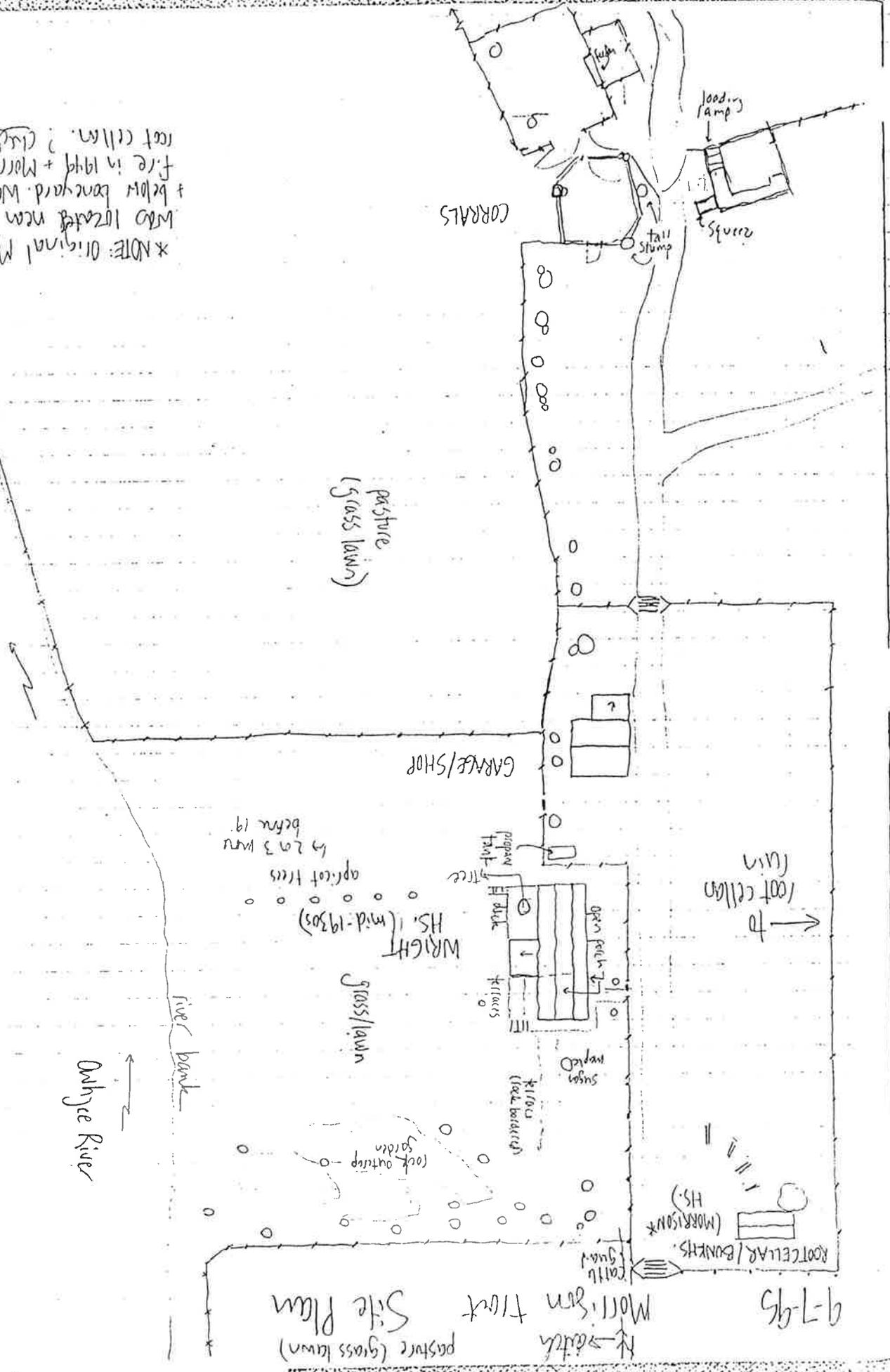


*NOTE: Original Morrison hs. was located near water wheel & below barnyard. Was destroyed by fire in 1919 + Morrison lived in root cellar? (check date.)



Morrison tract Site Plan

9-7-95



Ohhye River

river bank

pasture (grass lawn)

GARAGE/SHOP

WRIGHT HS. (mid-1930s)

grass/lawn

root cellar

(MORRISON HS.)

ROOT CELLAR/BUNKERS

CORRALS

tall stump

loading ramp

squares

open porch

propagator tree

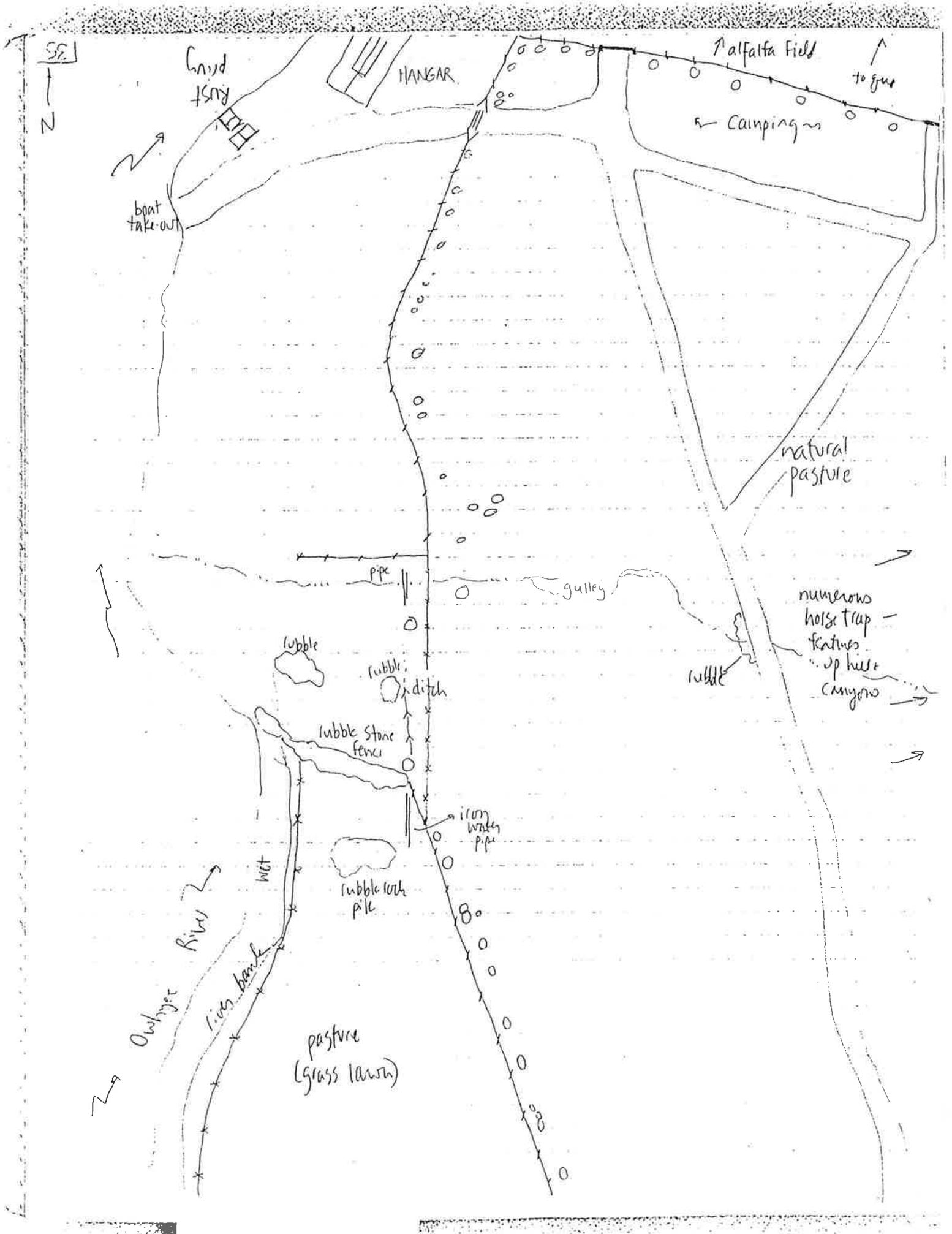
sugar maple

kitchen (deck boards)

cattle

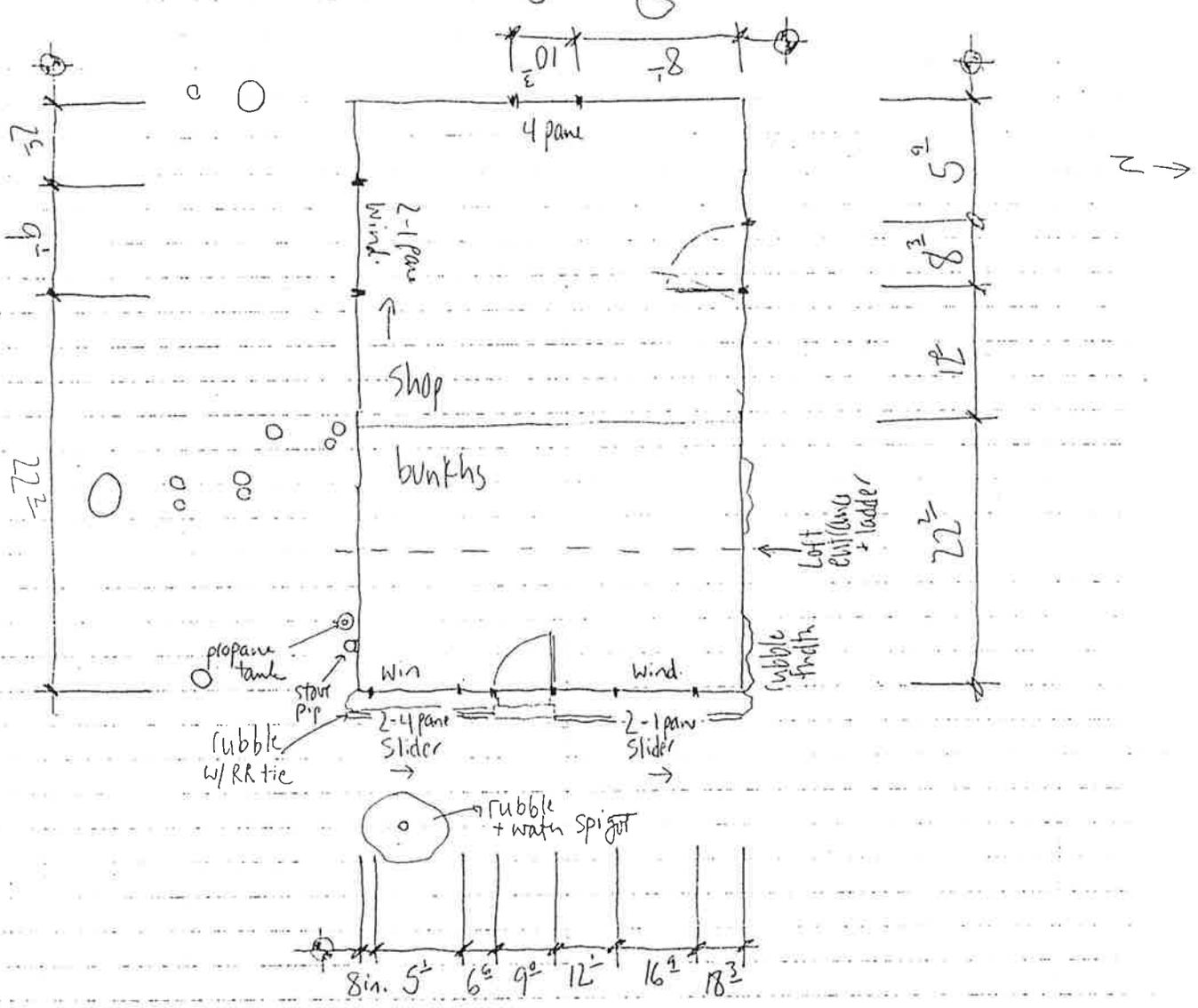
Morrison tract

pasture (grass lawn)



9-8-95 Birch Cr. parcel

Bunkhs./Shop
plivy



Foundation is rubble stone. There is evidence of some rot where wood members contact stone on N side near NE corner. On E side, site is weathered, but reasonably solid.

S side gets most weather. Here siding near SE corner is deteriorated where it comes in contact w/ soil. Soil has built up along this side & should be cleaned away from wooden members. In some areas the flooring appears to be in direct contact w/ soil.

Board & batten siding (other than where it reaches grade) is in good shape on S side & has been painted red. Soil should be

INTERIOR - gypsum bd. ceiling, gypsum bd. walls, flng is 3" x 6" laid diagonally. floor is solid, no springs. Newer waterstone was installed. E window in good shape. Don solid but should be kept painted. Don window has been caulked w/ silicon, not straight under putty.

This house is the oldest structure on the ranch & is kept almost entirely in shade all day.
 ic-roofing. Roof is sagging in center. - use 2x6 rafters
 Shakes on this side were applied directly, a top roller applied roofing. Roof sheathing is not really rotten when caulked but rump on top of it. This could be old damage created by window should be recalked with putty, graining

Window should be recalked with putty, graining debris that is trapping moisture. contact w/ grade. Gravel should be cleaned out of organic is moisture damage evident where bottom of siding comes in grade, presumably for drainage, along the side, still the W side has not been painted. There is a 2 ft. section of

SHOP
 around 4" - Roof sheathing of shop with 7/8" shop lap. W/wood shakes. Some siding bds are 16-18". Batts are sheathing is 1x16 - ^{with paper} ~~at least some samples have been covered~~ Rafter's are a good 36" o.c. + are not exposed to the outside. Roof batters along w/ wire nails. Some square + rosehead nails were used to attach siding. This side is a replacement of smaller (probably 4 panel) clear grade levelled near SW corner. Large window on

9-8-95 Bunks / Shop (cont)

9-8-95

Bunkies/Shop (cont)

Room off N of main room has some tilt to floor. It is covered w/ linoleum. This window in gable shape. Ceiling & walls same material. Joints where ceiling sheets come together was separated. Moved to the north - structure settling?

Shop - blacksmith area. 1 + bellows still remain. Door is missing knob + ~~the~~ pivot plate is loose. Door needs painting + window replacement. Glass is gone + has been covered w/ clear plastic.

Shop is of box construction (plank wall). There is an old weathered beam NW corner, N wall by door. 2x4 rafters are bowed slightly deflecting the weight of roof. There could be braced to help carry the load. Presumably new roof w/ shakes is well needed. Than original asphalt over wood shingles.

A work bench runs length of W wall. Bellows are near NW corner next to bench, weathered. Floor is dirt. There is a plywood

raised platform along S wall that is deteriorated + not strong to stand on. Cubby holes + shelving line 1/2 of E wall from SE corner going N. Another plywood work bench (beaten) runs along S wall.

Door leading into bunkies is typical 4" vertical T + G w/ ceramic knobs + cross braces. (2-braced door)

Shop wired for electricity + upgraded recently. (original wiring probably is only 25 yrs old at most.)

Because shop is of lesser construction, it is in worse condition. Upstairs loft is for storage only.

(Bees 1983:29)

around 1912

J.R. Blackaby was the owner of one of Jordan Valley Mercantiles

Ditch above is fed by Birch Cr. + water everything.

Bunches + get horse both electric v.a.
generator (generator shed) - inventory work.

all replanted; irrigation system in two parts by
horse was to be patches.

Recent work -

Chain of Title

by Beckham 1988

T27S R43E WM

Sec. 9 9-20-1917

NE 1/4 SE 1/4

James Morrison, assignee to the rights of Geo. Kowitz, T. Harvey Inckee, + Isaiah Barber, obtained 40 ac under a homestead patent Serial No. 04489 (Mathew Co. Clerk N.D.A. 351)

10-9-1919

Morrison sold the above (+ other lands) to Thompie Scoggin for \$8,000 - 160.28 ac incl. Lots 10, 11, 23 in Sec. 7

3-5-1923

Morrison sues Scoggin claim over above land deed + bids for property.

1-2-1929

Morrison, thru Sheriff's Sale, gained title to property in Secs. 7 + 9 160.28

Sold to George Wright, then to Morcorn

Sec. 7

[as above]

Sec. 18

12-22-1909

J.R. Blackaby, administrator of estate of Domingo Lequerica + Timothy Lequerica, sold for \$1.00 to Donata Uvernaga + Simon Ilcordagoitia E 1/2 SW 1/4

incl. water rights

+ NW 1/4 SE 1/4

10-26-1912

Donata Uvernaga sold to Simon A. for \$1,098.76
The above land

6-26-1918

Domingo Lequerica obtained patent to 122.63 ac Co. A Desert Land Entry, Series No. 638361 incl. Lots 18, 19 Sec. 7 Lots 4, 9 Sec. 18

(Alfonso's dad)

10-5-1937 Simon Acordagotia + Mercedes A. Acord. (Ings)
 sold for \$2,000 to Clyde W. + Sophia Bethel
 The above + E^{1/2} NW^{1/4}
 SW^{1/4} NE^{1/4}
 NW^{1/4} SE^{1/4} Sec. 23
 122.63 ac.

10-20-1937 Bethel's sold for \$10 to US Natl. Bank of Mex
 as of the above to cover mortgage

9-13-1944 Bank sold for \$10 to Rbt. Gannett
 the above

Interview w/ Jms. Morrison by Julian Field of Payette ID
Typewritten manuscript (ind.) in possession of Paul + Rita
Kraus (Birch Cr. Ranch on-site caretakers)

1. Morrison born in W.V. 1876, left ^{parents' home (1885)} 9 years later. Raised by
grandfather in W.V. Then moved to Kansas, lived there 5-6-7 yrs.
Moved due to "hard times came on and a shortage of money and he
mortgaged it to get the money." Went to Illinois + lived 4-5-6 yrs.
Grandparents getting too old. His mother + brother lived close.
Went back to living w/ them. He had 2 bros. + 1 sister.

2. Father died of cancer when Jim was 3. That's what broke
up household.

He then went to Calif. by age 15. Worked in Sacramento
(1891)
Then went to Nevada around Carson City in a creamery
making butter. Then went to Harney Co. Ore. age 16-17. Worked
(1893)
trapping coyotes "and monkeying around." Was educated by
neighbors. Got a job w/ co. Superintendent setting type for Co. paper.

p 3 Spent 2-3 yrs. doing that + getting an education. Then (1899)
went to Malheur Co. + "struck the Gwyhee" + at 23 yrs. old homesteaded.
"It happened to be a pretty good place. It was small, but I had
cattle and horses. I had about 150 head of cattle at one time and
about 100 range horses. I finally found somebody that bought the
whole place out. (1918) I did get a couple thousand dollars out of
them to start out. ^{in 1918} But they were people who couldn't do anything
unless they were horseback. They couldn't pay so I had to take the
place back on a mortgage. Lost all my stock. One of my
neighbors gave me a milk calf. It was the start of my new
bunch of cattle. ... Finally, I got up to 75 head when I sold out this
last time"

Sold out the last time about 3 yrs. says for \$12,000 and. Still. Sold to George Wright.

I had about 200 acres."

Soldiers' additional investment. I got a 40 of it. All together I bought from the Govt. a 40 out on the range. It was a land. I had yesterday 160 acres, with 28/100. [p. 5] Affirmative place. A little less than 40 acres. About 33 acres. I sold it without any help. About 20 years ago. I gated the whole two. Put hot rivets in it just like you make bridges. Done \$50.00 for it. There was really enough steel in it to make big steel where the Reclamation put in dams. I agreed to come, it went out. I had to build another. There was a middle of the river and even better the high water. Now we have more rapids. That put it right in the decided to move it down the river 200 or 300 feet where I put that in the first party that I sold to them to Montgomery Ward in Chicago & they sent me the steel with 2 pairs of into a firm. Really I put in two. I got "The present value is 31 feet high. The current left with 2 pairs of."

Fixed it, raised a little, got good power for many & started saving \$.

"Fences were all down and the water wheel was
came back to Chicago & had water his place out?
by 1932-33
fenced the mortgage
p4 but land too poor to raise cattle. During 1932-33 he
Bought land at Pasco on contract.
Went to Washington ~ 10 yrs. until Depression.

APPENDIX E

*Birch Creek Ranch Root Cellar
Repair and Maintenance Report*

RECEIVED

OCT 01 1993

ATTACHMENT C VALE DISTRICT

Project: Birch Creek Ranch Root Cellar Repair & Maint.
J-93-4

Date: 5/6/93

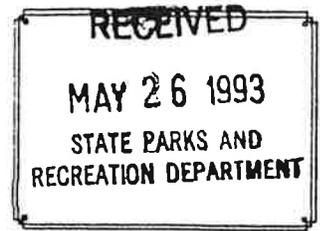
Resource Area: Jordan

County: Malheur

USGS Quad: The Hole in the Ground

Planimetric: Sheaville

BLM District: Vale



SHPO Receipt Date

For further information contact: Alice F. Bronsdon Phone No.: 503/473-3144

The criteria of effect listed in 36CFR800.9 (1986) have been applied to the above referenced project on the cultural resources identified in the attached report.

___ In accordance with 36CFR800.1(c)(ii), this is the agency request to participate in the above referenced undertaking. The 30 day clock begins from the date of receipt above.

___ In accordance with 36CFR800.5(b), we have determined that the proposed undertaking will have NO EFFECT. We will retain documentation and proceed with the undertaking unless you object within 15 days of receipt of this notice.

X In accordance with 36CFR800.5(d), we have determined that the proposed undertaking will have NO ADVERSE EFFECT. We will retain documentation and proceed with compliance unless you object within 30 days of receipt of this notice (see below):

___ The project is covered under PMOA: _____ with a ___ day time frame;

___ Attached is a research design for DATA RECOVERY option;

___ Attached are formal determinations of eligibility.

___ In accordance with 36CFR800.5(e), we have determined that the proposed undertaking will have an ADVERSE EFFECT. We will retain documentation and proceed with compliance unless you object within 30 days.

X CONCUR
___ DO NOT CONCUR

REMARKS:

DATE: SEP 28 1993

Signature

not covered by this



United States Department of the Interior

BUREAU OF LAND MANAGEMENT

Vale District Office
100 Oregon Street
Vale, Oregon 97918



IN REPLY REFER TO:

8111
J-93-4

Fri. 5/21

Ms. Elizabeth Walton Potter, Coordinator
National Register Nominations
State Historic Preservation Office
525 Trade Street, SE
Salem, OR 97310

Dear Ms. Potter:

Enclosed is a determination of no effect for repairs on the root cellar at Birch Creek Ranch, on public domain and managed by the BLM. You reviewed Stephen Beckham's Determination of Eligibility in December 1991, and concurred that the ranch properties were eligible as rural historic landscapes with ethnic associations.

The documents included are:

1. background information
2. historic building report and project plan by BLM Engineering, describing needed repairs and the materials that will be used to complete them.
3. letter report by Jill Chappel, HRA historian
4. elevations of the building
5. photographs showing the current condition of the building.

We ask your concurrence on these repairs. We believe they will have no effect on the root cellar, an element that contributes to the eligibility of the properties.

We will photo-document both the repairs as they are undertaken, and the finished building, and we will forward copies to you.

If you have questions or comments, please contact Alice Bronsdon at 503/473-3144. Thank you for your cooperation with this office.

Sincerely yours,

Jerry L. Taylor
Jordan Resource Area Manager

Enclosures (as stated)

REPAIRS AND MAINTENANCE:
A DETERMINATION OF NO ADVERSE EFFECT
TO THE STONE ROOT CELLAR, A STRUCTURE THAT CONTRIBUTES
TO THE NATIONAL REGISTER ELIGIBILITY OF
THE BIRCH CREEK AND MORRISON HISTORIC RANCHES

BACKGROUND

The Birch Creek and Morrison Ranches, formerly privately owned but now public domain, lie in the Owyhee River Wild and Scenic River Corridor, T. 27. S., R. 42 E., Secs. 7 and 8 and T. 27 S., R. 43 E., Sec. 18, Malheur County, Oregon, shown on the attached map. It is Bureau of Land Management (BLM) policy to consolidate public domain in Wild and Scenic River corridors by purchasing private inholdings or by exchanging lands with the inholder.

The BLM purchased the Birch Creek and Morrison Ranches from owner Marty Rust in 1988, leasing it back to him for three years. In 1989 Stephen Dow Beckham, BLM historian at that time, evaluated the properties and found them to be eligible for the National Register of Historic Places. In 1991 Mr. Rust vacated the properties and the BLM took physical possession. In the same year historian Beckham's report was forwarded to the State Historic Preservation Office. In her letter dated January 24, 1992, Elizabeth Potter of the SHPO concurred that the ranches are eligible for inclusion on the National Register of Historic Places as historic rural landscapes. In addition, the ranches' historic association with the Basque culture contributes to their eligibility.

The ranches, separated by less than two miles, lie in the Owyhee River Canyon. They have been continuously occupied since they were established in the late 1800s. Structures that contribute to the properties' eligibility date from the original occupation (stone fences, the stone root cellar) through the 1920s and 1930s (the water wheel, the old caretaker's house).

Access is very difficult, and was no less demanding during homesteading and subsequent development. Currently, it takes about an hour to traverse the four mile long four-wheel drive two-track road from the top of the rim to Birch Creek, the first ranch. During wet weather and when snow is on the ground, the road can't be driven at all. Marty Rust, from whom the ranch was purchased, constructed a small landing strip at one of the irrigated fields and simply flew in.

No decisions have been made regarding long-term use of the properties. Absent direction, the Recreation Program, which has over-all responsibility for the property, has been unable to write a recreation management plan. Without a recreation management plan in place, the Cultural Resource Program has been unable to write a cultural resource management plan. Decisions regarding property maintenance were deferred until the summer of 1992.

In the late summer of 1992 the Resource Area Archeologist and the Engineering staff inspected the structures that need repairs and maintenance. At that time it became imperative that some repairs be effected to prevent further deterioration of structures that contribute to the properties' National Register eligibility. A small contract to secure the services of an architectural historian was written by the Resource Area Archeologist and

funded by the Recreation Program. Historian Jill Chappel of Heritage Research Associates visited the properties in early October, 1992. She gave advice on techniques and materials to repair those buildings in need of attention.

Most pressing is repair and maintenance of the stone root cellar, a contributing structure. It is infested with pack rats that gain entry through its deteriorated roof, and through cracks at the joints between the stones where the original mortar has failed. The building was used for food storage when Mr. Rust owned the Birch Creek Ranch, and the BLM's caretaker, Paul Krause, needs a secure place for his winter supply of potatoes and onions. The ammoniac smell of pack rat urine, only slightly abated by spreading lime on the earth floor, precludes storing food in the stone root cellar, and there is no other suitable building.

REPAIR AND MAINTENANCE OF THE STONE ROOT CELLAR

The following project plan incorporates repairs and maintenance techniques that were jointly agreed upon by the BLM's chief engineer, the Jordan Resource Area's cultural resource specialist, and historian Jill Chappel of HRA. They are submitted for your approval. We believe they will not affect the integrity of the stone root cellar, a contributing element to the historic ranches' National Register eligibility, and in fact, will aid in its preservation. Ms. Chappel's letter report, photographs of the root cellar's exterior and interior, and engineering elevations are attached.

HISTORIC BUILDING REPORT AND PROJECT PLAN, BIRCH CREEK ROOT CELLAR
Vern Pritchard, Engineer

Building Description and Materials

The root cellar is a stone structure built into a hillside. It was used for storage and protection of perishables from both winter freezing and summer heat. The building is located approximately 100 feet northwest of the red bunkhouse. The structure faces east and has a typical double door and a wood roof. The roof is covered with tattered layers of tarpaper and is in need of repair.

The rock walls of the building are composed of local native and cut stone. The masonry is a composite of rubble and random range styles. The walls are approximately 18 inches thick and also form the gable ends of the structure. Note that the top of the side walls are pitched at the same slope as the roof. The stone was placed using a rather sandy mortar. At a later time it appears that the mortar joints were repaired with a harder mix of cement mortar. This material is harder than the original mix, and it has a smoother surface.

The roof sills are set in a mortar bed that was laid atop the rock walls. The method of anchoring the sills to the mortar bed is not known at this time.

A small window is located in the center of the north wall. This opening is covered with a shutter that opens to the inside. The eave sill covers the header of this opening. The frame is constructed of full dimension 2 by 4 lumber.

The roof sheathing is composed of multiple types of 3/4 inch to 1 inch boards of varying widths. This includes standard dimension lumber, shiplap, plywood and miscellaneous lumber. This entire menagerie has been covered by several layers of tarpaper of various kinds and weights. Selected areas are weathered to exposed wood and holes in the wood have been patched with pieces of tin and smashed cans.

A wood vent shaft extends from the center of the room through an attic space and exits the building on the ridgeline near the center of the building. This vent shaft is wrapped with tarpaper and has a modern tin mechanical ventilator attached to the top.

The roof is supported by a rather unique rafter system. The 2X4 lumber used to construct the rafters is finished dimension lumber and appears to be of more recent vintage than the lumber around the window. The structural layout of the roof trusses is detailed in the attached drawing. Note that shelving nailers are suspended vertically from the rafters down the inside of the walls. These nailers provided the structural basis for the shelving that lines the walls.

The attic area created by the board ceiling was not insulated. However, it is filled with packrat nests and feces, and bird nests. The building, as a result, has the characteristic odor of packrat urine.

On both sides of the door were two enclosures. These were constructed of wood and extended from floor to ceiling. The one on the north side of the door

was removed and the area lined with shelves for more storage space. This is the shelving with the paint cans shown in photos of the interior of the building. The enclosure on the south side of the door is filled with earth. This was typically done to provide insulation, but usually sawdust or a similar material was used.

The floor is earth and is covered with a layer of lime in an attempt to reduce the odor inside the building.

The door of the building is a double door typical of this type of structure. They are constructed of 1X6 and 1X8 lumber. The outer door opens out, while the inside door opens to the inside of the building. The doorway frame extends from the outside to the inside of the rock wall, and both doors are mounted on this frame. The sill is composed of 1X6 boards.

Note that modern nails appear to have been used throughout. To date, no cut nails have been found in this structure.

Building Repair Plan

A number of items about the building are in a deteriorated condition and repair work is necessary. The roof structure has large gaps between the top of the masonry walls and the roof that have allowed packrats to infest the cellar. The rafters visible inside the building are bowed due to abnormal compression from above. This compression has also displaced the sills in the top of the walls that the rafters are resting upon.

To correct the packrat problem and reset the roof sills, the entire roof structure will have to be removed and repaired. Because the wood is generally saturated with packrat urine, none of the wood is salvageable and will not be available for reuse. Perhaps some of the structural lumber will be salvageable; however, this will not be known until disassembly.

1. Roof replacement:

The roof structure will be replaced generally with materials and similar construction techniques as used in the original construction. This will include new 2X4 structural members and 1X8 sheathing for a roof deck and the interior ceiling.

Because the roof was originally structurally inadequate, it will be reinforced with additional 2X4 rafters hidden inside the structure. The existing rafters will be doubled by adding an additional 2X4 beside them. The ends of these new rafters will not extend beyond the blocking at the outside edge of the stone walls. This will retain the original appearance of the building eaves while providing desirable structural strength.

The roof deck will be covered with tarpaper and a new roof will be placed on top. New tin flashing will be placed along the roof peak. Because of the short lifespan of the existing tarpaper material used a roofing, the roof material should be replaced with shakes. These were not used on this building, so far as is known, but they will match the surrounding buildings, which generally have shake roofs.

The attic area will be insulated with fiberglass insulation. This addition will make the building much more weatherproof and will not be visible from the exterior or the interior of the building.

The roof sill plate that the rafters rest upon will be replaced with pressure treated lumber. This will ensure a longer life for this member, which is in an area subject to moisture collection. The space between the wood and stone or mortar will be caulked with clear silicon caulk. This material will be paintable. The goal is to make the building exterior as pest proof as possible.

2. Air Vent Modification:

The existing air vent has a modern metal mechanical ventilator atop it. This was obviously added some time after the building was originally constructed. The ventilator will be replaced with a typical "bird house" type roof atop the box vent shaft. The vent will be screened at both the top and bottom of the shaft.

3. Masonry Repair:

The top of the existing masonry wall will require repair prior to setting the new roof in place. This will be repaired in kind with the use of standard masonry mortar mix. A duplicate of the original mortar mix will be attempted. This mortar was fairly grainy and soft and contained a large percentage of sand. Concrete will not be used on this repair.

Cracks in the mortar will be re-pointed and filled in a manner similar to the original construction. This will be done on both the interior and the exterior of the building.

4. Shelving Replacement:

The shelving on the interior will be replaced with similar shelves. The arrangement will be one that is useable for storing food and non-perishable items. This may mean that the shelves may be of differing widths or lengths. The utilization plan for this building calls for it to provide storage for the caretakers who live on site.

5. Window Repair:

The window frame will be reset and repaired prior to replacement of the roof. At this point, the original material will be used, if possible.

6. Embankment Reshaping:

Approximately 6 to 12 inches of earth will be removed from the embankment that rests against the west wall. Over the years, slope wash has built up material against that side of the building. It is now so deep that the eaves of the roof are resting in the dirt. This is leading to accelerated deterioration of the rafters and roof deck. The slope will be lowered to at least 6 inches below the eaves. The area

where earth is removed will be blended into the surrounding slope so that the change is not readily apparent.

Building Maintenance Plan:

The actions listed below are guidance for the maintenance crews to follow when performing maintenance actions on the structure.

1. Wood Preservation:

The exterior wood, including eaves, rafters, eave blocks, and roof vent, will be painted a "Park Service" brown, using an oil base paint. There is no remaining evidence of whether or not these members of the building have ever had any type of preservative treatment. An oil base paint was chosen because it would have been available during the time period.

The door, window, and their respective frames will be treated with boiled linseed oil. This material was also available at the time, and was in common use. The linseed oil shall be applied by brush or spray gun to provide a uniform coat. Brush application would be typical of methods used; however, if the goal is to preserve the appearance of the weathered wood while protecting it, spray gun application would be less obtrusive.

The shakes on the roof will be spray treated with boiled linseed oil. This treatment on a two year basis should provide adequate preservation without making the roof appear over-treated.

Note that linseed oil will tend to darken wood and that, over a period of time, those areas treated will change color. Weathering, in turn, tends to lighten treated areas.

The wood on the interior of the building will remain unpainted or treated.

Cracks between the wood and masonry will be filled with clear silicon caulk. Cracks and joints requiring sealing between wooden portions of the building will also be sealed with the same material. Caulking will be painted to match the adjoining wood preservative colors.

The cracks in the exterior door and window shutter will not be filled. This will retain the original appearance of the building.

3. Masonry Maintenance:

The stone and mortar will be maintained in as near original condition as possible. This will include washing the building. However, no preservatives, abrasives, or chemical cleaners will be used on the stone or masonry.

Repair mortar will be mixed as close to the original as possible. The original mix was quite granular with a high sand content. Some commercial mortar mixes are quite close to the material originally used.

Cracks and joints will be re-pointed using the same methods as used originally.

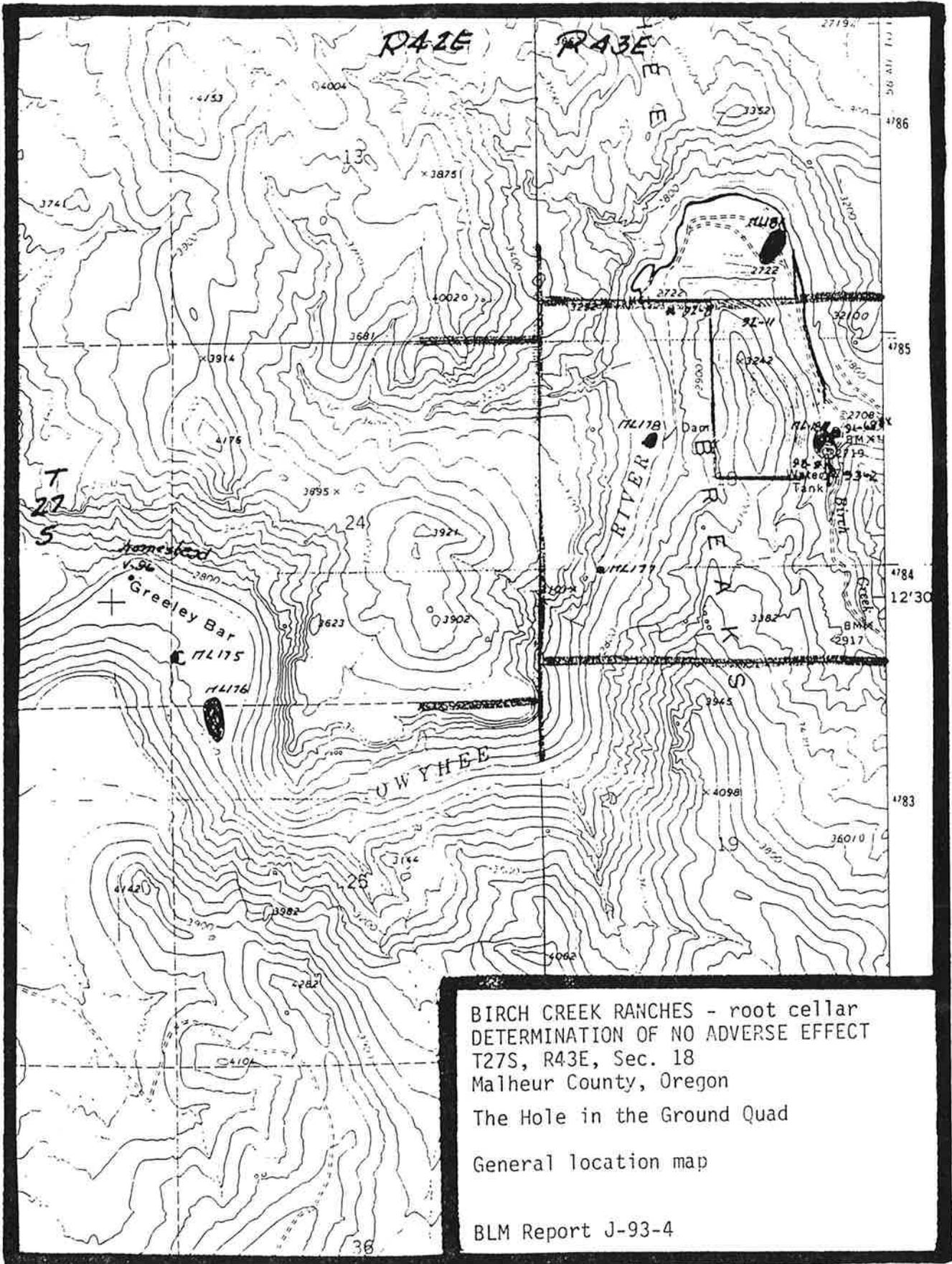
3. Surrounding Grounds:

Water-caused erosion will continue to bring soil and debris from the slope above the building to deposit it against the back of the building. This material will be regularly removed and the slope will be reformed behind the building as needed. The soil material will be kept a minimum of 6 inches below the eaves at the west end of the building.

Trees and weeds will be kept away from the building and will not be allowed to grow in the stacked rock on the south side of the building.

4. Building Interior:

The interior of the building will be cleaned and the shelving will be rebuilt. The use of the building as a working storage area will not be changed. The floor will be leveled and the lime previously placed on the floor will be removed. The wood on the interior will be left untreated or unpainted.

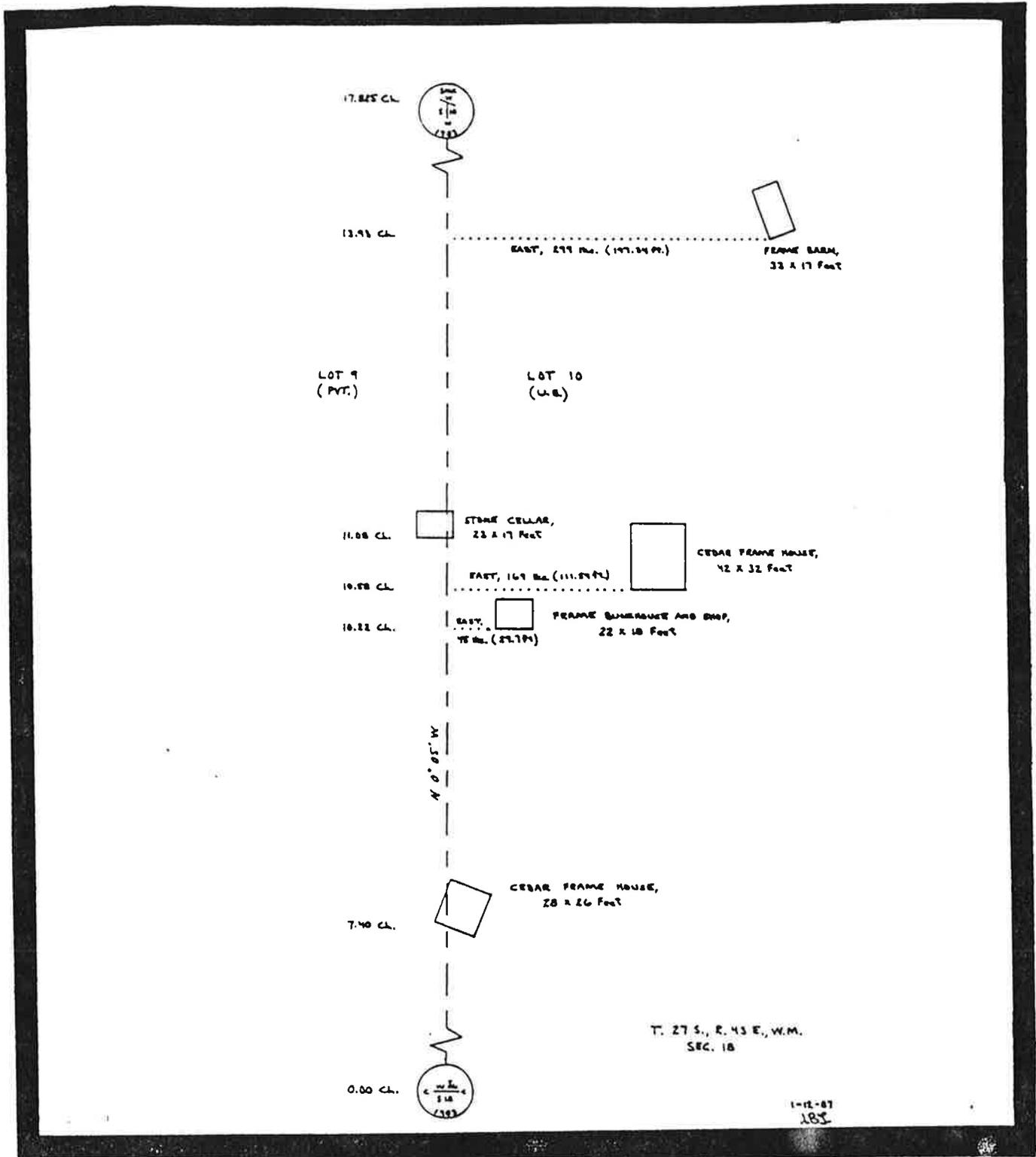


BIRCH CREEK RANCHES - root cellar
DETERMINATION OF NO ADVERSE EFFECT
T27S, R43E, Sec. 18
Malheur County, Oregon

The Hole in the Ground Quad

General location map

BLM Report J-93-4



SKETCH PLAT SHOWING LOCATION OF IMPROVEMENTS

BIRCH CREEK PLACE IMPROVEMENTS

APPENDIX F

Maintenance and Repair Worksheets

These blank master worksheets should be photocopied and marked up whenever a preservation project is done on any of the Birch Creek Ranch Historic Rural Landscape buildings. For example, if a post is replaced or repaired in the barn, the work should be noted on the worksheet drawing and kept as a record with other documentation of preservation work accomplished at the property.

BARN	Birch Creek Ranch
Project	<u>Repair of center post</u>
Date	<u>3-10-96</u>

Cut-off rotted base & replaced with solid piece pine log, 8" dia., tie-nailed in place

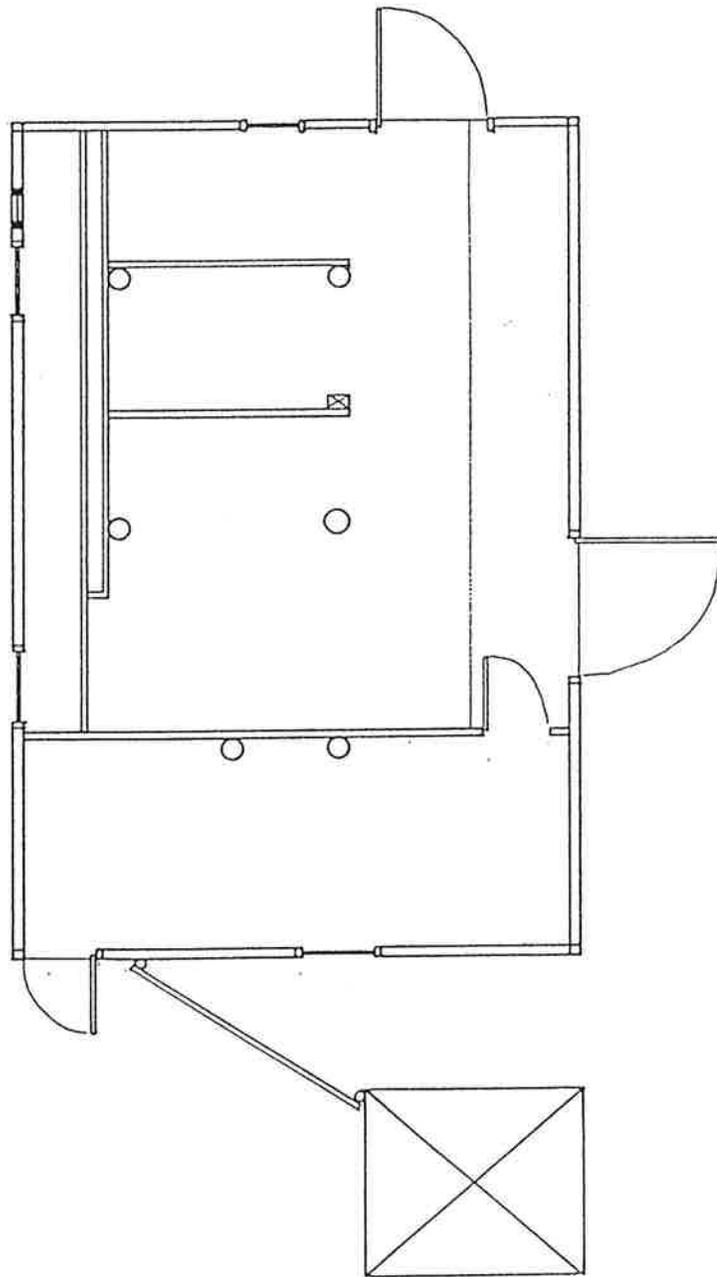
NOTES:
Work done by
Jae Smith, BLM
maintenance

BARN

Birch Creek Ranch

Project _____

Date _____

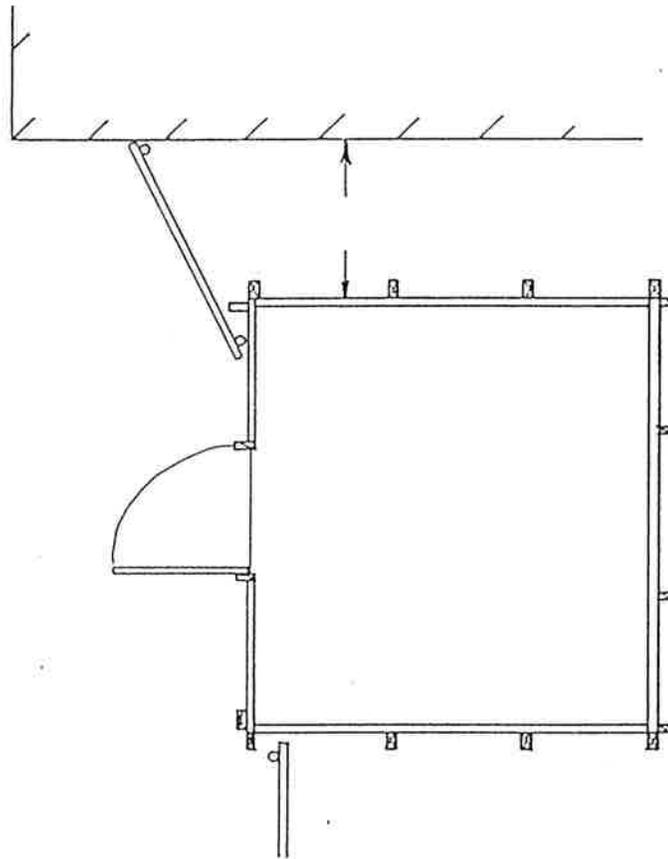


TACK ROOM

Birch Creek Ranch

Project _____

Date _____

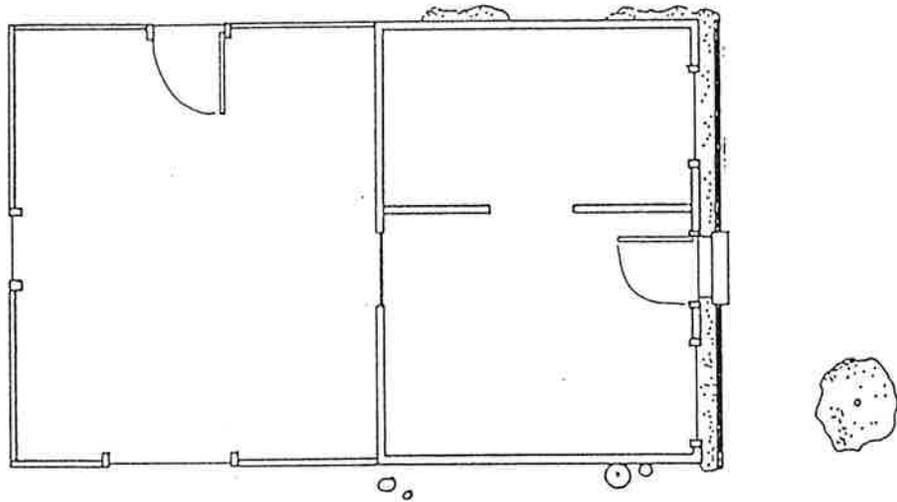


BUNKHOUSE/SHOP

Birch Creek Ranch

Project _____

Date _____

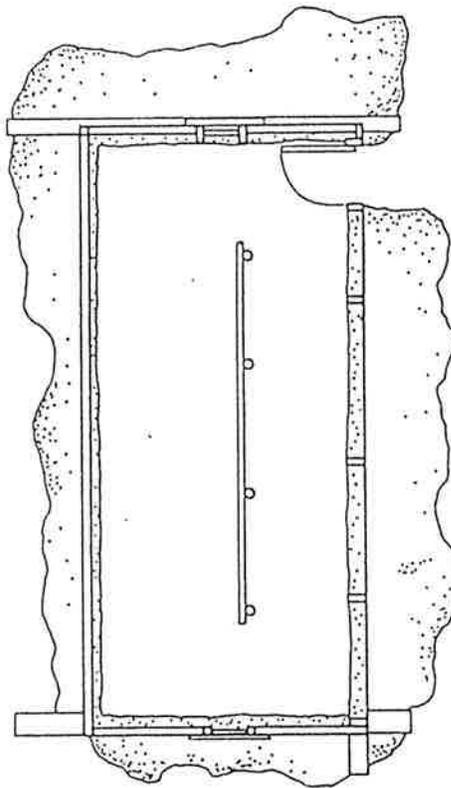


CHICKEN HOUSE

Birch Creek Ranch

Project _____

Date _____

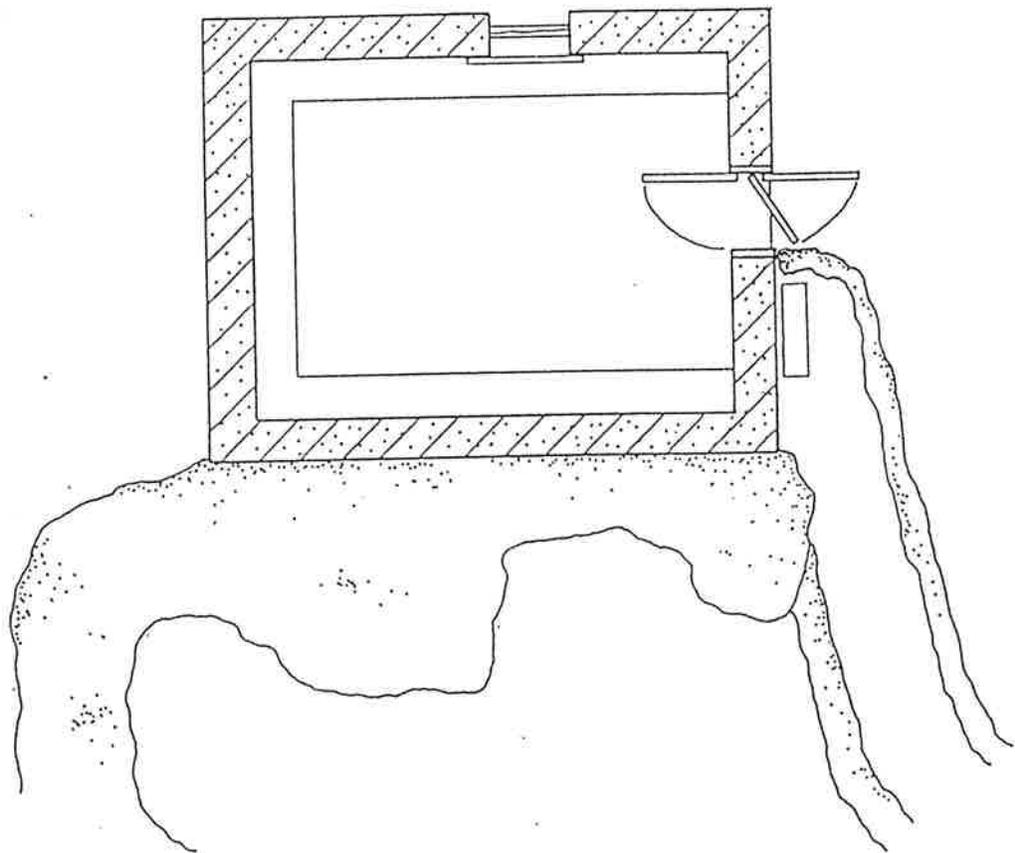


ROOT CELLAR

Birch Creek Ranch

Project _____

Date _____

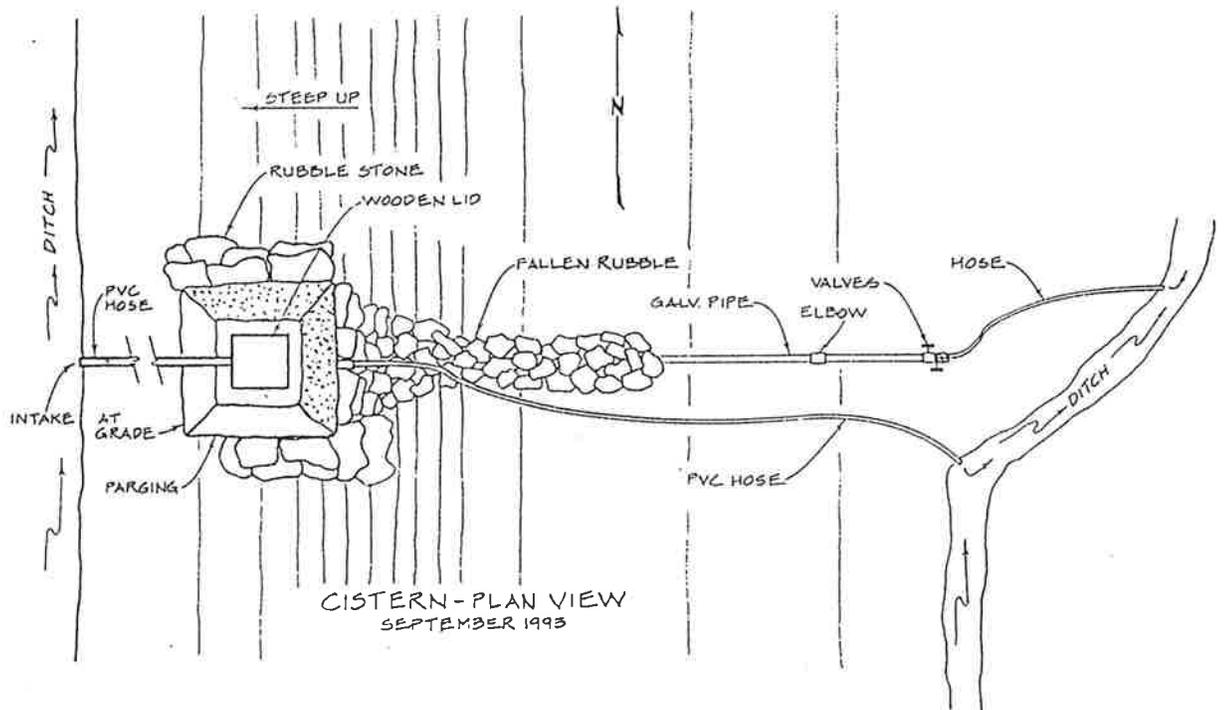


CISTERN

Birch Creek Ranch

Project _____

Date _____

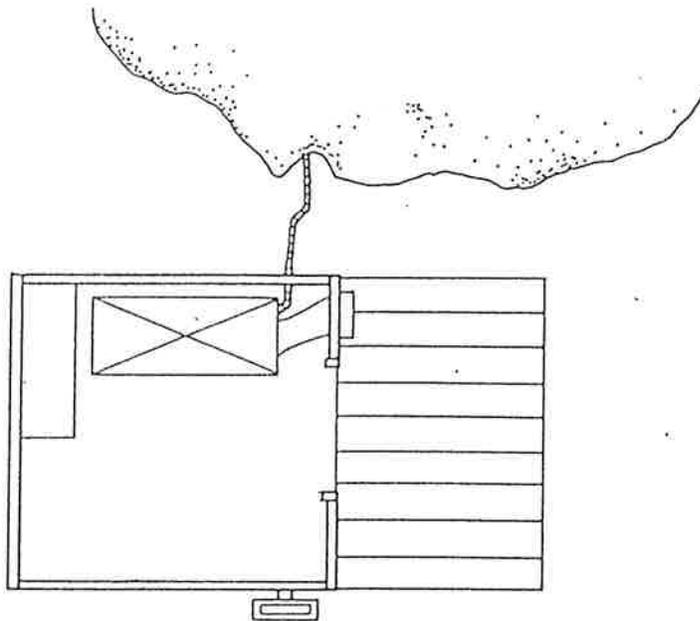


GENERATOR SHED

Birch Creek Ranch

Project _____

Date _____

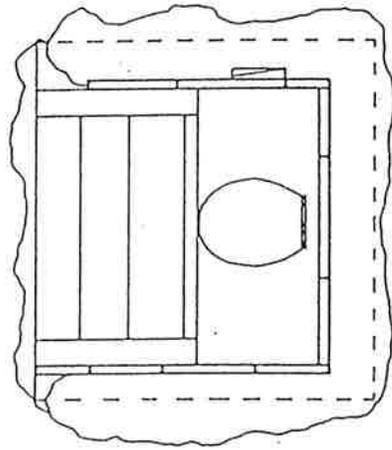


OUTHOUSE

Birch Creek Ranch

Project _____

Date _____

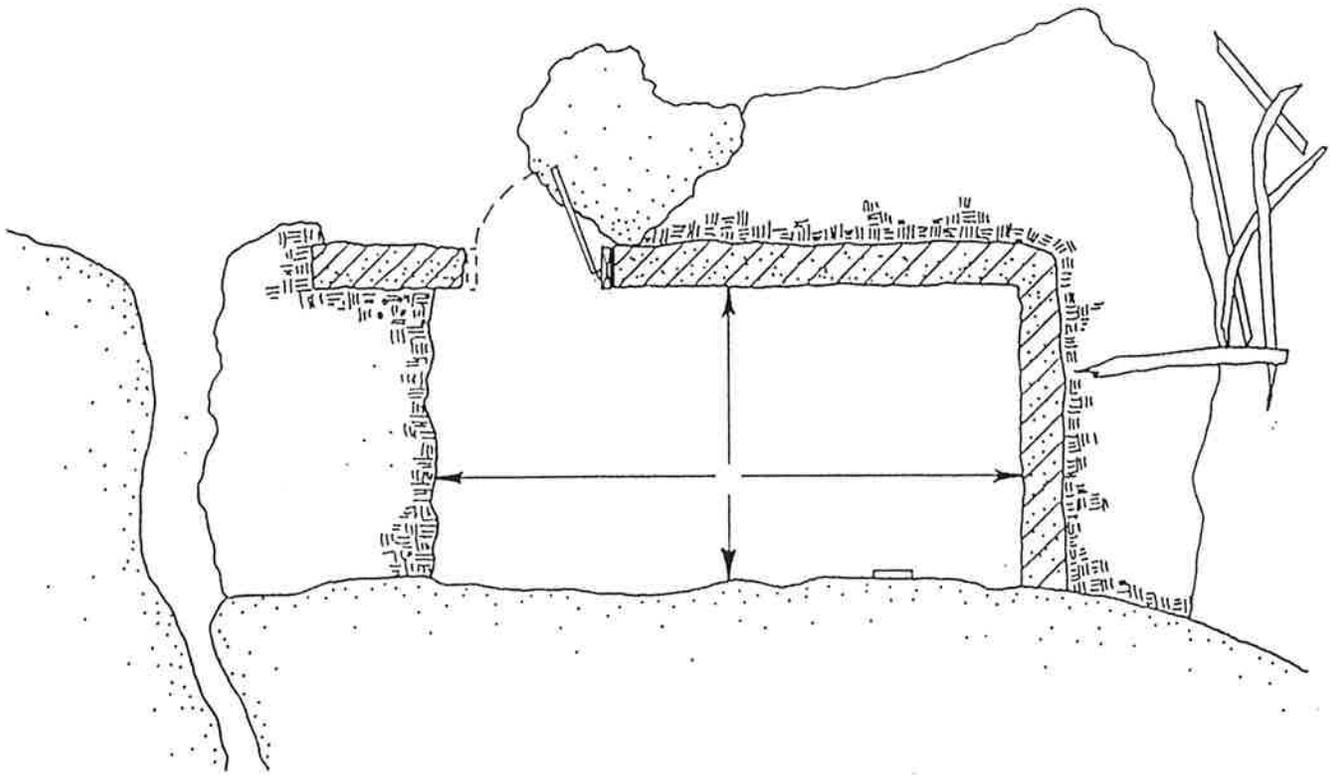


ROOT CELLAR RUIN

Morrison Ranch

Project _____

Date _____

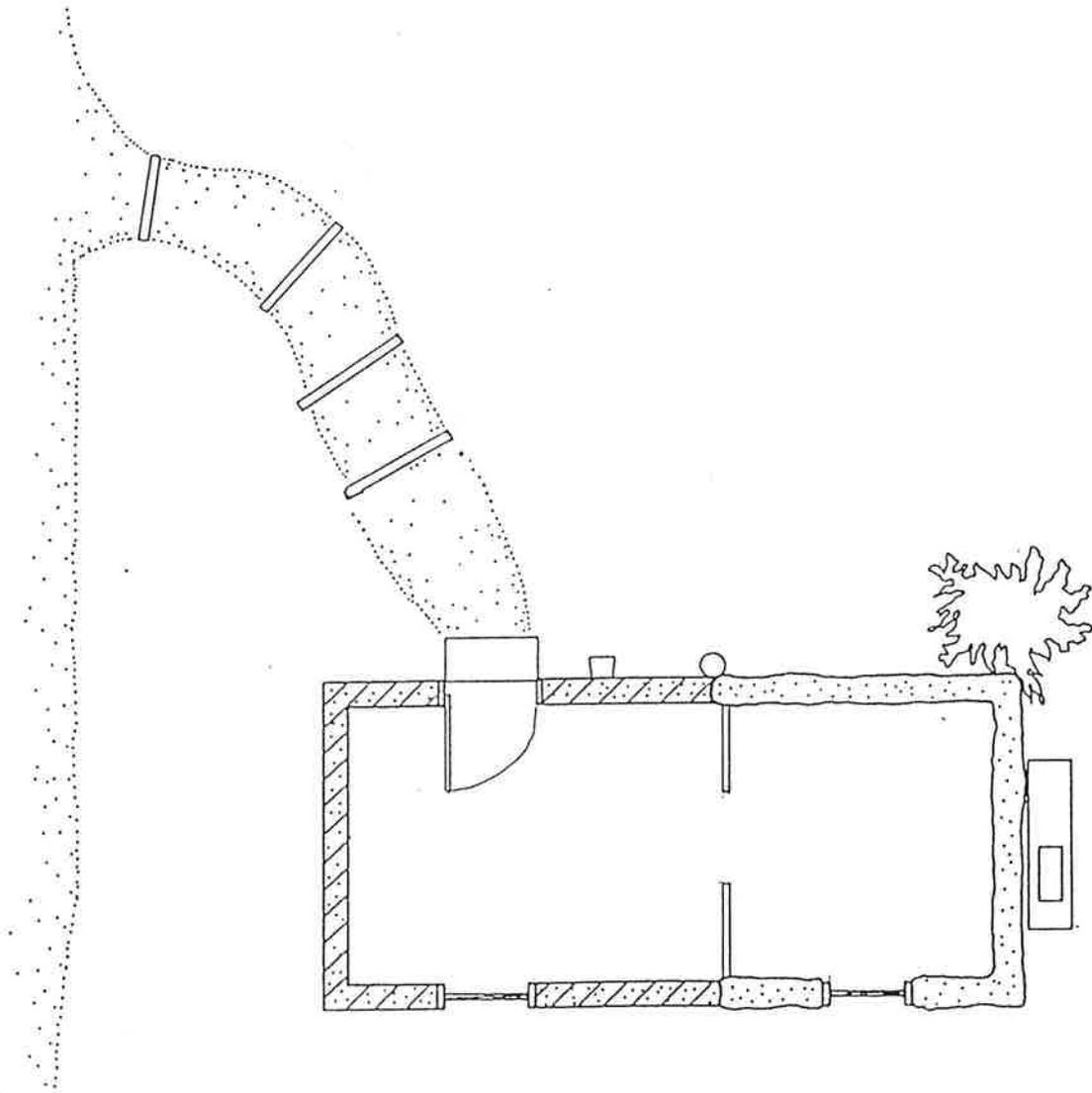


ROOT CELLAR/BUNKHOUSE

Morrison Ranch

Project _____

Date _____



GARAGE/SHOP

Morrison Ranch

Project _____

Date _____

