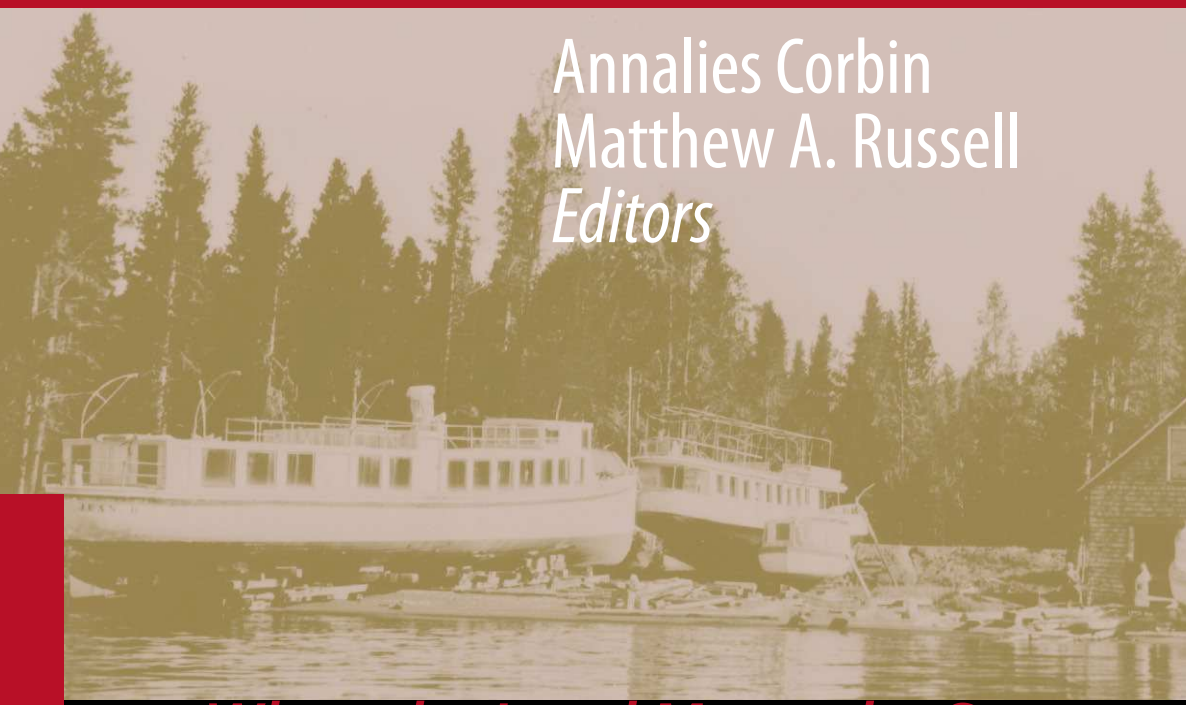

Annalies Corbin
Matthew A. Russell
Editors

When the Land Meets the Sea

Historical Archeology of Tourism in Yellowstone National Park

Springer

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WHEN THE LAND MEETS THE SEA: An ACUA and SHA Series

Series Editors: Annalies Corbin, *PAST Foundation, Columbus, OH, USA*
J.W. Joseph, *New South Associates, Inc., Stone Mountain, GA, USA*

HISTORICAL ARCHEOLOGY OF TOURISM IN YELLOWSTONE NATIONAL PARK

edited by Annalies Corbin and Matthew A. Russell

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Historical Archeology of Tourism in Yellowstone National Park

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(*Bottom*) Figure 2.13 from book: Rental boats at Lake (Yellowstone NP Archives photo no. 18771).

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For Rick Sprague, Larry Murphy,
and Dan Lenihan – mentors & friends

When the Land Meets the Sea – Series Introduction

Far too often in the field of archeology, the wheel of understanding and insight has a narrow focus that fails to recognize critical studies. Crucial information regarding pivotal archeological investigations at a variety of sites worldwide is extremely difficult, if not impossible, to obtain. The majority of archeological analysis and reporting, at best, has limited publication.

The majority of archeological reports are rarely seen and when published are often only in obscure or out-of-print journals – the reports are almost as hard to find as the archeological sites themselves. There is a desperate need to pull seminal archeological writings together into single issue or thematic volumes. It is the intention of this series, *When the Land Meets the Sea*, to address this problem as it relates to archeological work that encompasses both terrestrial and underwater archeology on a single site or on a collection of related sites. For example, despite the fact that we know that bays and waterways structured historic settlement, there is a lack of archeological literature that looks at both the nautical and terrestrial signatures of watersheds influence on historic culture. By addressing these types of overarching themes of interest on a specific topic under one cover the Society for Historical Archeology (SHA), the Advisory Council on Underwater Archeology (ACUA), and Springer will provide academic institutions, cultural resource management firms, and mandated archeological programs within governing agencies a set of powerful reference tools that more closely bind the discipline and elevate the standard of access.

With this in mind, it is our pleasure to introduce the first volume of this new series. "Historical Archeology of Tourism in Yellowstone National Park" explores the growing interest in the archeology of historical tourism as more and more cities, municipalities, historic districts, local, state, and national parks worldwide are being preserved and re-invented to interpret the historic role of tourism in the area. Nowhere is the idea of worldwide historical tourism more pertinent to planning and resource management than in national parks and preserves. In the USA, our first national park, Yellowstone National Park, has received extensive study of both environmental and cultural resources, both terrestrial and nautical. In both cases, one of the primary issues concerning park management is tourism – modern and historic. With this in mind, a volume on the Archeology of Tourism and its interplay

between both terrestrial and underwater archeological sites was clearly seen as a theme worthy of publication in this new series.

Annalies Corbin, PAST Foundation, Series Co-Editor
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**** All of the references cited above are listed in the volume bibliography.

Preface: Archeology in Wonderland

Centuries before the idea of the world's first national park was discussed around a frontier campfire, the Yellowstone Region was the focus of human activity. American Indian groups had long moved through the area, hunting and living along the shores of the high-altitude, volcanic lakes, rivers, and valleys. Evidence indicates a long history of human occupation and use of the unusual areas associated with the Yellowstone region. The earliest European American activities in the area mirrored those of American Indians, including hunting and trapping. These activities shifted toward scientific studies in the 1870s and, before the end of the century, included recreation, with heavy influence from concessionaires catering to the growing tourist trade. The activities of both indigenous groups and European Americans left behind a rich material record for archeologists to study.

Until recently, however, archeologists have struggled to find an appropriate context to apply to Yellowstone's historical sites. This is due in part to the relatively immense scale of the nearly state-sized study area (3,472 mile^2/8992.5 km^2) and an extremely diverse historical archeological record. The problem is compounded by historical archeological projects in the park that are typically driven by construction or natural disaster and are therefore necessarily short in duration and narrow in scope. As a result, Yellowstone has been subjected to a constantly changing field of investigators with little time to become familiar with the park, the historical landscape, and regional history. In an attempt to address these issues, a Treatment Plan was developed for Yellowstone's historic archeological sites (Hunt 1993). Drawing from Yellowstone National Park's 1872 enabling legislation as "a public park or pleasuring-ground for the benefit and enjoyment of the people," the plan utilizes tourism as the most logical context to study, assess, and interpret most historic sites within the park boundaries.

Although unprecedented as a subject of historical archeological inquiry, tourism has been a topic of anthropological inquiry for more than 30 years and its appeal to the discipline is both basic and quite timely (Bodine 1981; Nash 1981; Crick 1989). Tourism represents the single largest movement of human populations outside wartime and is a powerful force for culture contact and change (Crick 1989:309–310). Furthermore, the form and goals of tourism are culturally determined, shift through time, and vary between cultures (Graburn 1989). As archeology has traditionally directed the greater portion of its research toward issues of culture

change, tourism would seem a natural and entirely valid subject for archeological inquiry.

This volume contains three studies that trace the history of tourism in Yellowstone National Park through material remains discovered in both terrestrial and underwater archeological sites. A research approach with an archeological foundation opens new avenues of inquiry not available by using historical documents alone. Incorporating archeological materials into our interpretations of historical tourism in Yellowstone can help counter research biases that hamper use of a sometimes-fragmentary archival record. Archeology gives voice to people otherwise missing from written history, and therefore gives us the broadest view of the past.

A Geological Wonderland

Arguably the most popular tourist attractions in Yellowstone National Park are its natural wonders, largely the result of a complex and dynamic geological setting (this discussion draws heavily on Bradford et al. 2003). Western geologist F. V. Hayden (1872, 1873, 1883) pioneered geological studies in the Yellowstone area as early as 1871 followed by A. Hague's classic studies done between 1883 and 1902 (Hague 1899, 1904). However, the area's complexity was not well-understood until the work of Boyd (1957), and studies by Pierce (1979), Christensen (1984) and others have increased and refined knowledge of Yellowstone's complex geology. The most dramatic elements of Yellowstone's natural landscape are due to volcanism. The Yellowstone Plateau has been repeatedly destroyed, altered, and reshaped through geologic time. Beginning about 2 million years ago, a series of volcanic eruptions occurred in the general Yellowstone area creating four large calderas, three of which directly affect park topography. The first caldera eruption, about 2.1 million years ago, produced 965 km^3 (600 $mile^3$) of volcanic rock – 2,400 times more than the 1980 Mt. St. Helens eruption. This caldera is centered in west Yellowstone, extending westward into Idaho and eastward to include the area now containing the western half of Yellowstone Lake. A second explosion, the island park caldera, occurred 1.3 million years ago outside the current park boundaries but within the westernmost extension of the earlier caldera. The third caldera erupted about 650,000 years ago in the same vicinity as the first, overlapping and extending the newly formed Yellowstone Caldera 16 km (10 mile) northeast. This third caldera encompassed all of what would become Yellowstone Lake except for the two southern fingers (Southeast and South arms). More recently, about 160,000 years ago, a minor eruption, by comparison to the earlier ones, formed the West Thumb Caldera within the southeast portion of the much larger Yellowstone Caldera (Taylor et al. 1989). This formative geologic activity is caused by what geologists now believe to be the slow, southwestern movement of the North American tectonic plate passing over a stationary thermal mantle plume – a bulbous mass of magma that has risen from the earth's core toward the crust, which is slowly being flattened by crustal plate movement (Good and Pierce 1996:21). This tectonic movement over the mantle plume also uplifted

much of northwest Wyoming, southwest Montana, and southern Idaho, resulting in Yellowstone's 2,450 m (8,000 ft) average elevation (Good and Pierce 1996:21).

The park's history of glaciation is equally important in the formation of Yellowstone's natural wonders. Yellowstone Plateau's glacial history is as complex as its volcanic history. There were at least 10 glacial periods in the Yellowstone region – the most recent began around 70,000 years ago, reached its maximum size about 25,000 years ago, and all but vanished 15,000 years ago. The Yellowstone Plateau ice shield was separate from the North American ice shield and covered the entire area in an almost flat ice mantle for miles in all directions. During this last glacial period, the ice mantle was 1,200 m (4,000 ft) thick above much of Yellowstone. Because of Yellowstone Plateau's modest elevation, early warming significantly affected the area when the Yellowstone ice field began to shrink about 20,000 years ago. As the ice thinned, the underlying volcanism was uncovered; interactions between stagnant ice and hydrothermal features were abundant, resulting in today's numerous hydrothermal features that characterize the Yellowstone Plateau. These include an estimated 150 geysers and more than 5,000 hot springs, hot pools, and steam vents. These geothermal features, particularly geyser basins, are concentrated along streams and on lake shores where the necessary concurrence of heat and water is found. These remarkable features have no peers, and they have made "Yellowstone" synonymous with geothermal activity (Haines 1996a:xix).

A deep public fascination with the Yellowstone region's spectacular natural wonders led to the creation of Yellowstone National Park by the Congress on March 1, 1872, as a "pleasuring ground for the benefit and enjoyment of the people" (Tilden 1951:98). It was the world's first national park. The idea of preserving a vast territory in its natural state for the general public was a novel concept, particularly in a young country where extractive exploitation of seemingly limitless resources was considered to be a natural right. The reality of preserving this large area is even more astounding, although it took almost a half-century of experimentation to learn how to manage such an unparalleled undertaking.

The fledgling park was an exciting, new experiment, but it had a nearly disastrous beginning. Congress failed to define basic guidelines and appropriate funds, which were limited in the post-Civil War recovery era. Park management and protection responsibilities were given by law to the Secretary of the Interior, initiating federal land management policies. The managers believed the growth of a tourist economy resulting from the Northern Pacific Railroad reaching Montana would ameliorate the lack of park operational funds. No railroads were built for the next 6 years, however, which meant no tourist growth, no concessionaires, no fees, and ultimately, no money for park operations (Haines 1996a:179). After the failure of the first two park superintendents, the park soon fell victim to an onslaught of poachers, woodcutters, vandals, and squatters. The Secretary of the Interior, lacking both park funding and a superintendent, enlisted the aid of the Secretary of War, which was allowed under the act establishing the park. Beginning in 1886, the US Army had jurisdiction of Yellowstone, which proved a positive management step for the park. The Army had sufficient manpower for mounted patrols and law enforcement. They posted new regulations in the park, and constant military patrols enforced them.

Congressional appropriations increased, and the Corps of Engineers began a series of improvements that included completion of a road system. The Army's Yellowstone legacy is most visible at their Mammoth Hot Springs headquarters, initially at Camp Sheridan, then at Fort Yellowstone, which houses park headquarters today (Clary 1972:43).

Although the army's record over the next 30 years was admirable, something more was clearly needed. The army was not in the business of running parks, nor could they meet requirements of the rapidly increasing tourists who craved more information about the park. During this period, 14 other national parks were established, each managed independently. This situation caused uneven management, inefficiency, and a general lack of direction. By 1916, it was clear that a government agency was needed to provide coordinated national park administration, complete with professionals able to meet protection responsibilities and other special park needs, including a new concept called interpretation (Clary 1972:44). On August 25, 1916, President Woodrow Wilson signed into law a bill creating the National Park Service (NPS). Yellowstone management and protection responsibilities passed from the army to the NPS in 1918.

After assuming management responsibility for Yellowstone National Park, the NPS emphasized public interpretation and portrayed parks as part of an intricate interrelationship of humans and their environment. The NPS extended Yellowstone's boundaries to encompass related natural topographic features, protect petrified tree deposits, and increase elk winter grazing range. Developers' attempts to impound the Yellowstone River were successfully defeated, and solid research into the park's natural resources provided a foundation for more sophisticated wildlife and forest management policies. A better understanding of park ecology led to better ways of allowing public access to the park's natural wonders without inflicting severe environmental impact (Clary 1972:44–45). This pioneering Yellowstone management style continues today throughout the National Park System.

From Heritage Tourism to a Tourism Heritage

From the establishment of the park to the present, the impetus for development and park operations was to provide access to the visiting public. Therefore, tourism is the theme and the context connecting the studies present in this volume. As Hunt (Chapter 1 of this volume) notes, the majority of historical archeological sites in Yellowstone National Park are in one way or another byproducts of tourism and the tourist industry that developed in the late-nineteenth century. This is true both for sites found on land and those submerged in park waterways. Tourism, as a broad research theme, sweeps across the Yellowstone landscape and encompasses the park's lakes and rivers where distinctive aspects of tourist infrastructure arose to take advantage of visitor interest. In some cases, such as Yellowstone Lake's maritime sites discussed in Chapter 2, the material remains are deliberately nautical and include familiar features of ships, boats, and docks, similar to remains found in

coastal areas. In other cases, such as archeological deposits at the Marshall/Firehole Hotel presented in Chapter 3, the site's location adjacent to a river or other water source led to cultural remains underwater, even though the sites do not directly link to maritime activity. In this sense, the cultural landscape of tourism in Yellowstone crosses seamlessly from the land to the water and unifies archeological resources under a single research umbrella.

The chapters in this volume trace the conceptual progression of historical sites in Yellowstone from the land to the water, including sites that naturally straddle the two. In the first chapter, Hunt lays the contextual foundation for the study of historical sites in Yellowstone, both on land and underwater, by outlining a theoretical framework for an archeological study of tourism. Since the early 1990s, research in Yellowstone was guided by a "contextual model based on anthropological studies of tourism which envisions historical archeological sites as by-products of a park's operations" (Hunt, Chapter 1 of this volume). Hunt divides his discussion of the model into several sections. He begins by outlining tourism as a primary research context. In his second section, he justifies the approach and defines an area of inquiry. Next, Hunt presents a detailed context and developmental model based on the interaction of three primary socio-economic spheres of influence. This is followed by a synopsis of the characteristics and structure of tourism and definition of four periods at Yellowstone beginning with the park′s 1872 inception and continuing to the start of World War II. Finally, he identifies a diverse range of potential research topics that may be used to address archeological resources, including aspects of cultural landscape, economics, the tourist system, architecture, subsistence, ethnicity, and health and sanitation.

The volume's second chapter (Russell et al.) highlights the unique maritime infrastructure that operated on Yellowstone Lake in the late 19th and early 20th centuries. The authors begin by developing a specific historical context for Yellowstone Lake, highlighting the role tourism played in creating the structures and vessel remains present in the lake today, as well as how they were connected to the outside world. They then briefly discuss previous archeological work around Yellowstone Lake, serving as a baseline for the survey reported here. The chapter then outlines the idea of a maritime system as a subset of the larger tourist system at work in Yellowstone National Park, and as a framework for interpreting maritime archeological remains found in Yellowstone Lake. A detailed discussion of the archeological sites recorded in the lake follows.

In Chapter 3, Corbin et al. focus on archeological documentation of the Marshall/Firehole Hotel, the first "tourist town" constructed in a national park. The hotel site relates to the national park system's developmental history; it is directly associated with a fundamental purpose of the National Park Service – "to provide for the enjoyment of park resources and values by people of the United States." Until recently, the site was believed to be destroyed by an early-19th-century road barrow pit. Archeological investigations in 1993–1994 demonstrated the hotel's continual existence with nearly invisible archeological features. Archeologists also discovered an unusual riverine component derived from the hotel occupants' disposal of trash in the adjacent Firehole River. Although the land-based portion of the site is

not in excessive danger, vandals are rapidly destroying the underwater component. In response, the National Park Service (NPS) and the PAST Foundation created the Marshall/Firehole Underwater Archeology Project as a cooperative venture partially funded through an NPS-Intermountain Region Challenge Cost Share grant. Participants included archeologists and volunteers from Yellowstone National Park, the PAST Foundation, NPS-Midwest Archeological Center (MWAC), East Carolina University, and the Lincoln (Nebraska) Public Schools Science Focus Program High School. The project combined a variety of research and interpretation goals and offered a unique educational opportunity for the public to participate in and learn about archeology.

These chapters draw together the fascinating historical archeology of Yellowstone National Park into a single volume linked by a common research framework, the archeology of tourism. While oftentimes treated as separate and unrelated resources, historical archeological sites on land, underwater, and in the liminal zone in between, connect in Yellowstone through a shared history and a universal purpose. Situating these sites within the context of a larger tourist infrastructure allows us to broaden our interpretation and enriches the stories the sites have to tell.

Columbus, OH — Annalies Corbin
Lakewood, CO — Matthew A. Russell

Acknowledgments

William J. Hunt, Jr.

The development of the tourism model was a by-product of a number of years of archeological investigations by author and others in Yellowstone National Park after the "Great Fire" of 1988. It was developed as the primary element of Yellowstone′s Archeological Treatment Plan for historic sites and was prepared after months of archival research and consultation with several people who have immersed themselves in the history of the park. Most notable is the late Yellowstone historian Aubrey Haines. Aubrey freely opened his home, mind, and research files to me, providing information he had gathered over a lifetime as a Yellowstone National Park Ranger and park historian. I also often turned to Aubrey′s "children," the next generation of researchers active in studying Yellowstone history. Prominent among these are former NPS Rocky Mountain Regional Historian Mary (Marcie) Culpin, Yellowstone National Park Resource Naturalist Paul Schullery, and Yellowstone National Park Archivist Lee Whittlesey. Lee, especially, has generously offered his time, information, and access to Yellowstone historical materials. He has reviewed past manuscripts, gently corrected my mistakes, and offered much-needed clarification of details. Guidance in preparation of the original Treatment Plan and opportunities to conduct archeological investigations in the park over the past 16 years was made possible by Yellowstone National Park Archeologist Ann Johnson. My work at Yellowstone and subsequent research into Yellowstone historical archeology was generously supported by MWAC Manager Mark Lynott, former Midwest Archeological Center (MWAC) Chief F.C. "Cal" Calabrese, former MWAC Division Chief for Rocky Mountain Research Douglas Scott, former Rocky Mountain Regional Archeologist Adrienne Anderson, and former Rocky Mountain Regional Architect Rodd Wheaton. Many NPS and concessions employees working in Yellowstone have generously spent time with me and provided information useful in the development of the tourism model and other archeological investigations I was fortunate enough to conduct in the park. I would especially like to mention the late Yellowstone Research Geologist Roderick "Rick" Hutchinson and Yellowstone′s Lake District Ranger John Lounsbury. Finally, I would like to extend my appreciation to PAST Foundation Director Annalies Corbin, co-Principal Investigator in

my most recent Yellowstone research venture at the Marshall/Firehole Hotel site, and for providing this venue for publishing this long-overdue article. Of course, any errors in fact or theory which may occur in this document are entirely my own.

Matthew Russell

Many people contributed to the success of the Yellowstone National Park Submerged Resources Survey. The park staff's foresight in dealing with submerged cultural resources on equal footing with terrestrial cultural resources and natural resources made this project possible. The staff at that time, Superintendent Michael Finley; Chief Ranger Rick Obernesser; Dr. John Varley, Director, Yellowstone Center for Resources; Laura Joss, Chief, Branch of Cultural Resources; and Lake District Ranger John Lounsbury, all played key roles in project planning and execution. Yellowstone Dive Officer Wesley Miles and Rangers Rick Fey and Gary Nelson worked with us daily and provided logistical support. Cultural resources staff members assisting with archival research included: Supervisory Museum Curator Susan Kraft, Lead Museum Technician Vanessa Christopher, Museum Aide Linnaea Despain, and Historian/Archivist Lee Whittlesey. Retired Park Historian Aubrey Haines provided much insight into Yellowstone Lake's maritime history, particularly regarding the tour boat *Zillah*. Other park staff and volunteers who assisted include: Travis Wyman; Bill Archer; Bob Ryan; Frank and Beverly Ford; Frank Pais; Ian Ablett, steam engineering consultant; Stan Liddiard, marine surveyor; and VIPs Greg and Linda Lalonde.

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Annalies Corbin

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Chapter 1
A Model of Tourism as Context for Historical Sites: An Example of Historical Archeology at Yellowstone National Park

William J. Hunt, Jr.

Yellowstone National Park, well known for its unparalleled concentration of hydrothermal features and scenic vistas, is dramatic and awe-inspiring to modern visitors. Tourists of the 19th century found it equally striking and described the park as a "Wonderland," a name that has stuck to this day. The natural features of Yellowstone spark a visceral reaction in many to the point that the public often views the park as a pristine wilderness virtually untouched by human artifice. Nevertheless, decades of archeological investigations have revealed an almost continuous human occupation in Yellowstone, one that extends for at least 9000 years into the past.

Native American occupation of the park area has long been accepted. In fact, the park's first superintendent, Philetus W. Norris, occasionally mentioned Indian "relics" and structures in his official communications to the Secretary of the Interior (Norris 1879, 1880, 1882). William H. Holmes, a member of the US Geological Survey team exploring Yellowstone before it became a national park, noted aboriginal use of obsidian at Obsidian Cliffs (Holmes 1879). By 1956, Yellowstone Park Ranger Wayne Replogle had enough information to prepare a map showing locations for 80 prehistoric and historic Native American sites in the park (Replogle 1956).

Only recently, however, have archeologists acknowledged the existence of historic EuroAmerican sites in Yellowstone National Park. Prior to 1987, when the first historical site was recorded in the park by NPS Archeologist Ann Johnson, Yellowstone was considered to have few significant historic sites. The human occupation in the region, however, has been particularly intense over the past 125 years and the effects of that occupation easily transcends the effects of the region's prehistoric occupation. Yellowstone's historic cultural resources are surprisingly numerous and often cover extensive areas. Nevertheless, they remain largely obscure to the public. To some extent, their anonymity has been a by-product of nature itself. The plethora of historic sites created and abandoned since the park's creation in 1872 are now

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hidden by erosion, soil formation, reforestation, or meadows "renovated" by the National Park Service. As a result, areas extensively modified by human action are largely camouflaged by an always awesome, wondrous, and (apparently) unspoiled scenery.

From the anthropological perspective, though, a non-physical agency may have had perhaps an even greater role in obscuring Yellowstone's historic sites; i.e., mythology in American culture. The power of mythology as a means of explaining the world around us is well known whether it be in an Amazonian rainforest tribe or in our own culture. The operation of myth in this case is manifested as an inclination to deny or ignore the importance of past human activity in our "natural" National Parks. Upon occasion, this perspective has led many adherents both inside and outside the National Park Service to question the importance of a "natural" park's history. This "Natural Park Myth," put simply, can be expressed as, "The park is a natural area which has been preserved intact, unaltered and unencumbered by human development." A corollary of this myth reflects its anti-cultural theme; e.g., "The natural park has no significant history and thus has no important historical archeological resources."

In effect, the myth reflects a neo-romantic philosophy, which is an outgrowth of our Victorian past. This philosophy holds the natural as good, the artificial as bad (or at least not as good as the natural). Taken to the extreme, the corollary of this philosophy might be "preserve the natural and obliterate or ignore the artificial." Certainly, the ideas of "natural" and "wilderness" can be used to describe many locales within all of our "natural" parks. Nevertheless, those most strongly attached to the "Natural Park Myth" tend to disregard the large-scale cultural (read "artificial") development enveloping those features determined to be most significant from a naturalist perspective.[1]

For some, the "Natural Park Myth" has obscured the fact that Yellowstone and most other National Parks in the system are not true wilderness anymore and probably have not been since at least the 1890s.[2] From one perspective, Yellowstone can even be considered a cultural artifact, with more-or-less "natural" areas preserved in place through deliberate *cultural* actions. Arguably, this view could be carried to an extreme to the point where one might consider much of the park's ecosystem as a kind of artifact. Following this argument, the park, like any artifact, is a natural object which has been significantly altered from its pre-human state by human activities over the past 12,000 years. This transformation has exponentially increased in intensity since the late 1880s as park managers and concessionaires have consciously interfered with the prehistoric ecosystem that once existed via construction of roads, trails, lodging and other tourist support facilities, as well as through the park's various game management and protection actions.

Whether or not one adheres to this view of National Park as a cultural artifact, one must acknowledge that significant changes to the Yellowstone National Park's environment have occurred since its creation in 1872. Many of the highly prominent natural features at Yellowstone, the very features that prompted the Congress to set aside the area as a park, are now completely surrounded and entangled by a maze of man-made objects. In effect, a cultural landscape has been created and overlaid

on the natural one. In some cases, this cultural landscape is so obvious it is almost intrusive, while in others the cultural landscape is more vague although impacts are similarly great. Two examples will suffice to emphasize this point.

Most will agree, for instance, that a major focal point for Yellowstone tourists is the area around Old Faithful Geyser in the Upper Geyser Basin. The basin is promoted as a natural location, a perspective that most tourists would probably agree with. Intensively impacted by well over 100 years of construction, the area is literally a maze of abandoned and extant cultural features. From one end of the basin to another are abandoned roads and trails, building foundations, garbage dumps, campgrounds, drained lakes, etc. Furthermore, the modern environment near Old Faithful with its stores, hotels, roads, post office, etc., certainly bears more resemblance to a small town than it does to a natural unspoiled locale.

Obviously, the evidence for past and present human activities is visible everywhere in heavily visited developed areas. Not so obviously, human actions have left their marks in many of the park's less well-developed areas as well. Such is the case for the Lower Geyser Basin. Here, a casual visitor observes a large and relatively pristine area, one marred only slightly by a few roads, hiking and biking trails, and picnic areas. The scenic views through the basin appear to be strikingly free of artifice but appearances are very deceiving, for this was once a major center of the tourist trade.

Given this history, it is not surprising that park historians and recent archeological investigations have identified dozens of historic sites in the Lower Geyser Basin dating from the late 1870s through the late 1930s (Hunt et al. 1994a; Hunt 1994a; Hunt et al. 1995, 2005; Karsmizki et al. 2001; Corbin et al. 2003). Among these are three hotels; military encampments, soldier stations, and firing range; stage roads; abandoned hiking trails; blacksmith shops; corrals; a stage station; an internal park administrative headquarters facility; road construction camps; gravel quarries, autocamps; a bathhouse; a Civilian Conservation Corps camp; a Shaw and Powell permanent camp; log dwellings; and numerous garbage dumps created by the occupants of the other types of sites. Many sites are quite extensive and incorporate a variety of cultural features. For example, the Fountain Hotel site (48YE786) retains evidence for at least 12 structures, several large artifact concentrations (a.k.a. garbage dumps), three water supply systems (two hot and one cold), and an extensive system of wagon roads (Hunt et al. 1994). All of these features occur within a 20+ ha area (about 50 acres)!

Much of the vegetation in the Lower Geyser Basin has been impacted or seriously altered through historic human activities. One of the least obvious actions which has had a tremendous impact on basin environment was the construction of an extensive system of drainage ditches through eastern portions of the valley during various periods of road and highway construction.[3] The resulting environmental changes, especially with regard to flora and soils, are speculative as it has never been studied. It had a number of cultural advantages, however. Drainage of the basin's natural wetlands along the rights-of-way aided road construction and subsequent road and highway maintenance. Pasturage was improved for the large herds of cattle and horses maintained in the basin by the hotel and transportation companies through

at least 1916 when automobiles were finally allowed into the park. Drained wetlands also assisted park managers and concession companies with their annual hay harvest during that era of horse-drawn conveyances.[4]

These examples from the Upper and Lower Geyser Basins demonstrate that historic human activities affected the natural elements of the park, sometimes in a major way and always in a permanent way. Once an impact occurs, the scar of human actions remains forever on the landscape.[5] In short, Yellowstone National Park is not simply a "natural park" but a unique blend of natural and cultural elements each of which is important in its own right. Each has something to communicate about the world as it once existed and as it has evolved through time to the present. Our "natural" National Parks (e.g., Yosemite, Yellowstone, Isle Royale, Voyageurs, and Everglades) are, in essence, also important "cultural" National Parks. All areas of our country were inhabited, utilized, and often heavily impacted by prehistoric and historic Americans before their status as National Parks was achieved. As a result, all "natural" parks have large numbers of cultural sites within their boundaries, which directly reflect each park's unique and important history.[6]

Within this context, Yellowstone National Park's history is of particular significance for this is "The Place" around which the seminal National Park idea was expressed and where it became manifest physically as the first National Park in the world. As such, Yellowstone has always been a proving ground for National Park management. The various facets in the evolution of Yellowstone, from a remote wilderness with an annual visitation rate in the hundreds to a developed area easily accessed by millions today, have occurred nowhere else. Historical events and cultural processes important in this development are reflected physically through the myriad primary and secondary documents and collectible objects in various archives and collections at the park and throughout the country. Those events and processes, however, are most *directly* reflected in the park's many historical archeological sites. These physical resources contain invaluable data about Yellowstone's human occupations which have not been and cannot be duplicated elsewhere. Furthermore, they provide Yellowstone with tangible entities for interpretation of the park's creation and developmental history should Yellowstone's management decide to do so. As such, the historical archeological resources in Yellowstone deserve all the respect and protection that are now afforded to the park's natural resources and prehistoric cultural resources.[7]

In fact, Yellowstone National Park and other parks within the National Park system have made great strides toward acknowledging the value of their historic sites.[8] At Yellowstone, this occurred (at least in part) as by-products of a natural disaster and major, parkwide construction events. In 1988, one year after the first historic site was recorded in the park, Yellowstone endured a massive wildfire. This holocaust, which burned about 45% of the park (approximately 1.1 million acres), had one unexpected result. The loss of vegetation cover made it evident that the park was strewn with literally hundreds of garbage dumps, road scars, foundations, and other historic sites. The questions immediately raised were the following: (1) Are any of these sites significant? (2) Can they be picked up and hauled off?

The second thing bringing attention to the park's historic sites was the severe deterioration of the park's road system and, in response, the development of a Park-wide Road Improvement Plan (Yellowstone National Park 1992). The goal of this plan was to repair, upgrade, and reconstruct Yellowstone's 329 miles (529.47 km) of damaged highways over the following 20 years. The planning process was incredibly complex, involving a host of federal, state, and local agencies. This bureaucratic complexity spawned concern among Yellowstone's managers that unrecognized communication gaps could exist which might impede or obstruct the cultural resource planning process and highway construction. In an attempt to address these issues, the National Park Service signed a Programmatic Agreement with the State Historic Preservation Offices of Wyoming and Montana and the Advisory Council on Historic Preservation outlining the responsibilities of each agency in the planning process (Advisory Council 1993; National Park Service 1993). Among the requirements for Yellowstone National Park was the development of an Archeological Treatment Plan.

This plan (Hunt 1993a), developed by the National Park Service's Midwest Archeological Center, has been implemented successfully since. Among its key elements is a contextual model based on anthropological studies of tourism, which envisions historical archeological sites as by-products of a park's operations. The model helps structure historical archeological research and assists with the interpretation of historical site function.[9] Furthermore, the model is equally promising as a tool which, with some slight modifications, can be applied to other national, state, and local parks as well as to non-governmental tourist locales.

The Cultural Sites Inventory for Yellowstone National Park, as revised in 1999, lists 349 historical archeological sites recorded in the park. These are classified according to generic named types which provide few clues as to the nature and function of the sites.[10] While the named types suggest broad diversity, with a few exceptions they are not useful descriptors. How does one make sense of this type of data? This chapter presents an outline for a historic context, "Yellowstone National Park Tourism Development," whose application allows an understanding of the function of each site within a specific place and time.

The model is divided into several sections for purposes of clarity. The first is an overview of a research context, tourism, which was developed by the author and has been used successfully at Yellowstone National Park for over a decade. In the second section, a justification for the approach is espoused and an area of inquiry is defined. The third section presents a detailed context, a developmental model, based upon the interaction of three primary socioeconomic spheres of influence. This is followed by a synopsis of the characteristics and structure of tourism and definition of four periods at Yellowstone beginning with the park's 1872 inception and continuing to the start of World War II. A diverse range of potential research topics are then identified which may be used to address these resources. These include aspects of cultural landscape, economics, the tourist system, architecture, subsistence, ethnicity, health and sanitation, and changes in these entities through time.

Research Context: The Archeological Study of Tourism

"Context," as a cultural resource concept, is one of the more important elements of preservation law and policy. According to the National Register Bulletin 16A,

> Historic context is information about historic trends and properties grouped by an important theme in the prehistory or history of a community, State, or the nation during a particular period of time. Because historic contexts are organized by **theme, place, and time**, they link historic properties to important historic trends. In this way they provide a framework for determining the significance of a property and its eligibility for National Register listing. A knowledge of historic contexts allows applicants to understand a historic property as a product of its time and as an illustration of aspects of heritage that may be unique, representative, or pivotal (National Park Service 1997).

James E. Ayres is notable for developing the first historic context for evaluating Yellowstone historic archeological resources. Entitled "Historic Period Trash Deposits, 1872–1939" (Ayres 1989:77–78), this context, as its title suggests, focused exclusively on the park's dump sites and trash scatters. Although intended as an introductory approach, the context was developed to the degree that Ayres' posited 11 general research questions related to the variations in deposit form; distributional variations in the park through time; associations with various economic, status, or social and organizational entities; seasonality of the park occupations; and interrelationships with other types of sites.

Although it was a good start, the "historic trash deposits context" was an oversimplified approach to understanding and evaluating Yellowstone sites. While it was certainly effective with dump sites and historic trash scatters, it was not suitable for assessing other kinds of sites. The approach also had the tendency to simplify the nature of a number of site types (homesteads, soldier stations, hotels, permanent camps, etc.), with the result that many were considered as little more than varieties of garbage dumps (Ayres 1989:79–80). In short, the historic trash deposits context was too specific to be maximally effective.

The variety of site types, associations, sizes, contents, etc., at Yellowstone is as complex as its history. These reflect the activities of two civilian and one military systems of administration; myriads of hoteliers, camping companies, transportation companies, and other tourist-based businesses; the installation of roads, trails, highways, electrical systems, water systems, sewage systems; and the maintenance of those systems; etc. To understand and assess the significance of this kaleidoscope of cultural resources, the primary context for historic sites at Yellowstone should be that which is most inclusive. It should have the capacity to deal with the greatest variety of site types and the potential to recognize interrelationships between those sites. The context, in short, must reflect the *raison d'être* for the park's existence as a part of greater American culture. As stated in the park's Organic Act, the park was intended by the Congress to serve as "a public park or pleasureing-ground for the benefit and enjoyment of the people" (National Park Service 1933:26). In essence, the creation of Yellowstone National Park was based upon and tied to a cultural phenomenon called "tourism." Tourism, then, is the historic context proposed here for identifying and evaluating Yellowstone's historic sites. Although this context

does not claim to be able to deal universally with all types of sites within the park boundaries, it is probably the most inclusive conceptually.

Justification for Approach

Tourism has been considered a valid and important subject for study in the social sciences in general for some time and in the field of anthropology it has been a relatively hot topic for at least 30 years. According to John Bodine (1981), the first organized anthropological review of the subject was a symposium of the Central States Anthropological Society in 1964. The earliest anthropological publication on the subject was derived from a paper presented at that meeting. Since that time, the subject of tourism has been accepted by the discipline as a whole. This is clearly demonstrated by the first critical assessment of the subject in *Current Anthropology* in 1981 (Nash 1981) followed by tourism as the focus of an interdisciplinary review in *Annual Review of Anthropology* only a few years later (Crick 1989). These overviews indicated that, despite a great deal of interest on the part of the anthropological community, its approaches to tourism remain in their infancy. This opinion is supported by the fact that a large number of articles have been published on the subject over the past two decades but no full-length monographs have appeared to date.

Crick (1989:309–310) has noted that tourism is of profound importance to the discipline of anthropology for a variety of reasons. As an industry, it is of great economic importance to the point of its currently being the single largest item in world trade. It also obviously represents the single largest movement of human populations outside wartime. Millions of people travel all over the world every year and tourism historically has been a major force in culture contact and social change during the past two centuries. These short-term demographic changes obviously have and will continue to result in the expression of tremendous forces toward cultural acculturation. It is also clearly true that tourism has culturally determined goals which change through time and from one culture to the next (Graburn 1989:28). All of these are well within the realm of traditional anthropological inquiry.

Archeology in the United States, at least, has always been regarded as a subdiscipline of anthropology. As a part of this conceptual frame, archeology has traditionally directed the greater portion of its research toward areas of inquiry to which its peculiar data are best suited; i.e., culture history and culture change through time and over space. Therefore, it would seem logical to suggest the archeological investigation of tourism as an entirely valid subject to pursue. Such an approach would appear particularly well suited to the investigation of Yellowstone historic archeological resources as well as those in other National Parks and locations where the following conditions prevail:

1. Tourism is the major management focus consuming either directly or indirectly the greater portions of a park's [or other entity's] annual budget and resources.

2. The economics of tourism has a large impact upon the greater economy of the area or region.
3. Tourism and its evolution have significantly affected the physical development of the area's cultural and natural resources.
4. A significant portion of the historical sites relate to tourism in some manner.

It is plain that the first three conditions are the case at Yellowstone. Furthermore, even a minimal review of the park's history and known cultural resource base establishes that the preponderance of historical sites in the park is related in some way to tourism (National Park Service 1999).

Definition of Tourism

Tourism has been defined by a variety of authors in a number of subtle and often conflicting ways. In this case, "tourism" will be considered as any activity characterized by travel, conspicuous consumption, and pursuit of other than normal (secular) activities (Turner and Turner 1978; Robinson 1979; Smith 1981; Graburn 1989). This is not a new or unique definition but merely incorporates a set of commonly repeated variables.

The extent of travel involved in tourism can vary considerably. At one end of the scale are the relatively quick and simple one-day shopping trips or "getaway weekends" to a nearby town or city. At the other extreme are such things as extensive international voyages requiring planning and, perhaps, assistance from travel agents and other tourist-based businesses which specialize in effecting such an event.

Touring also requires the conspicuous consumption of resources which were accumulated in secular time (Schwimmer 1979:223). The tourist must work and save (sometimes) considerable amounts of money and it is not uncommon for a person to "go without" other desirable commodities in order to harvest the fruits of the approaching holiday. The accumulated wealth is then expended at a rate which would be considered profligate and irresponsible under normal circumstances but entirely appropriate when the vacation is underway.

One of the unique aspects of tourism is that it represents a kind of export industry, one where the consumers themselves travel to collect the goods which are both tangible and intangible (Crick 1989:334). This has the effect of creating a set of sociocultural consequences missing from other export activities to the extent that tourism can result in considerable cultural and economic impacts even where actual contact between tourists and locals does not occur.

One of the more interesting facets of tourism is that it usually entails non-secular activities, that is, activities that lie outside those of normal, everyday existence. In this respect, various authors (Turner and Turner 1978; Crick 1989) have noted that a tour exhibits strong similarities to the religious pilgrimage (the following discussion is heavily borrowed from concepts developed by Turner and Turner 1978; Robinson 1979; Nash 1981; Pepper 1984; Crick 1989). The tour and the pilgrimage

both obviously involve travel marked by stages or conditions of existence which are out of ordinary. These stages can be categorized as "separation," "advance," "sojourn," "return," and "aggregation" (these terms and concepts are particularly based upon the movements of religious pilgrims discussed by Turner and Turner 1978:2, 4–11, 22).

The initiation of the pilgrimage or tour is marked by the physical *separation* from one's normal everyday activities and associated social structures (Turner and Turner 1978:2). As noted earlier, travel can involve crossing political and cultural boundaries and usually represents a release from the ingrown ills of home for both the pilgrim and tourist. The separation is significant for its nonobligatory nature; e.g., the individual is not required to leave but instead chooses to leave at a specific day and time. As noted earlier, tourism has values which are culturally specific and change through time. The choice of departure and destination represents the demonstration of an individual's freedom of choice – an important element in Western tourist culture. It may be expected that in other cultural spheres, personal freedom of choice plays a lesser role or may be nonexistent altogether.

Following "separation" is "*advance*," or that portion of the trip where the traveler moves toward the focal (destination) point (Turner and Turner 1978:22–23). Travel for the pilgrim and tourist can take a number of forms although each usually travels in the company of others. Such travel can involve organized parties or independent movement within a throng of people with similar perspectives and goals. Whether the trip is made by the pilgrim or by a tourist, it exhibits in either case an inversion of everyday life experiences. This aspect of separation from the normal bounds of existence and behavior has already been somewhat alluded to earlier in the tourists' conspicuous consumption of valuable resources.

On this leg of the journey, the traveler is increasingly confronted with symbolic structures. The tendency here is for the tourist (or pilgrim) to stop at natural areas of lesser importance (minor religious or natural sites, pictorial images, etc.) to view (pray) and prepare for the visit to the major natural site (shrine). A trip from Lincoln, Nebraska, to Yellowstone National Park, for example, might include brief stops at Mount Rushmore National Memorial in the Black Hills, South Dakota; Devils Tower National Monument, Wyoming; and perhaps the hot springs at Thermopolis, Wyoming.

The third phase of the trip is the *sojourn*. This is the point in time where the traveler has finally reached the focal point of the trip, be it religious shrine or major natural site. To a greater or lesser degree, the sojourn is marked by a kind of "liminoid" realm of existence. "Liminality," in the anthropological sense of the word, refers to the state and process of transition, as in a rite of passage. This psychological condition is based upon strongly held mystical or philosophical convictions. Of course in the pilgrimage, religious mysticism is the philosophical motivation behind the trip and the mystical point of focus for the pilgrim is the sacred site located at some distance from the normal place of residence and daily labor. For the tourist, the philosophical perspective appears to be Romanticism and the liminoid state is encountered at some rural location perceived as a "natural area" (more or less free from human development). Conceivably, the liminoid state could also be

achieved in an urban park where "natural" conditions have been recreated by landscape architects (Central Park in New York City, for instance). Characteristics of the Romantic philosophical movement of the late 18th and 19th centuries involve the rejection of rationalism, formal rules and restrictions in art and about society, and the mechanized urban civilization created by the Industrial Revolution. These were complimented by the promotion of the subjective (imagination and emotion), an appreciation of more informal forms in art and music, and a spiritual affinity for nature as a source of purification and renewal. Prominent among the beliefs of the romantic, either those of the past or those holding neo-romantic views today, is the value of all life forms and natural areas for their own sakes rather than things of economic utility (Turner and Turner 1978:1–12, 22–23).

The liminoid quality of tourism is particularly evident where travel to and enjoyment of a natural resource or environment is involved. Such forms of tourism are occasionally referred to as "environmental" or "nature" tourism (Graburn 1989:31). Conceptually, such tourism can embrace a broad gamut of travel and activities focusing on one or more resources provided by the outdoors. Among these may be such diverse things as travel to the beach or mountains for purposes of swimming, sunning, skiing, etc.; mountain and seashore parks for viewing scenic vistas and "natural wonders"; as well as camping, hiking, cycling, hunting, or other similar activities. Whatever the activity, whether passive or active, the individual engaged in environmental tourism is seeking and engaging with natural resources of some kind.

For the pilgrim, the liminoid state is the conspicuous and most important aspect of pilgrimage for this is the point in the trip where previous orderings of thought and behavior are subject to revision and criticism. It is also the occasion where new modes of ordering relations between ideas and people become desirable and possible. Therefore, it can be seen that the midpoint or focal point of the trip for the pilgrim not only represents a state of transition but also has a potentiality for change. The degree to which the individual pilgrim or environmental tourist understands the potential for and degree of alteration may be quite variable, and it is likely that few consciously grasp more than a fraction of the message being transmitted (see Turner and Turner 1978).

The religious aspects of the pilgrimage are echoed in environmental tourism (Almagor 1985; Graburn 1989:31–32, 35). Here one can see a number of concepts which view "wildness" as the antithesis to "domestic" and "naturalness" as absence of "artificiality." The tourist has the freedom to wander at will satisfying a need for solitude and individuality. This can occur as a psychological state-of-being while in the midst of a crowded beach or as actual physical isolation on a ridge in a wilderness area. The environmental tourist seeks simplicity as homogeneity of forms and often speaks of "openness" and "grand vistas" providing an almost "religious experience."

At the end of the sojourn, both the tourist and the pilgrim engage in the "*return*" phase (Turner and Turner 1978:22). During this period, the individual usually visits few sites or none at all. This is because the aim of the return is usually to reach home as fast as possible. The tendency in the previous stage is usually to extend the

"sojourn" as long as possible. Often, this continues until the time and/or funds have been all but expended and the tourist has no alternative but to hurry home.

The final phase is "*aggregation*," the point in time and space where the tourist/pilgrim returns home and is rejoined to his or her previous socioeconomic environment (Turner and Turner 1978:2, 22). All returns to normal with regard to work and social interactions. Here, the travelers regale their companions with the events of the trip, the wonders beheld, and the personal transformations in body and/or spirit that the vacation or pilgrimage has brought.

Tourism in America

In its general developmental history, American tourism exhibits many parallels to the forms and motivations expressed in Europe (this section is based upon the discussions of tourist history provided by Robinson 1979:xxvii, 3–19; Bodine 1981; Nash 1981; Graburn 1989:28–32). This is obviously due to the strong historical and cultural interconnectedness of each area with variations from one region to another based upon divergent themes in American and European cultures. In its many aspects, the form(s) of tourism developed during each historic era represent a physical reflection of the era's philosophical foundations and technological development.

Its ultimate antiquity may never be discerned exactly, but it is clear that tourism requires an accumulation of wealth, a substantial amount of leisure time, a well-developed and dependable transportation system, and the inclination to travel. All of these elements are common only after the rise of complex agricultural societies.

A major development which eventually led to the park tourism familiar to us today was touring directed toward outdoor "natural" activities. This was spawned as a reaction to changes wrought by the Industrial Revolution (increase of mechanization, the wholesale transformation of urban landscapes, and the enhanced political power of the middle and working classes). Outdoor activities were a product of the rise of Romanticism, a major philosophical movement which glorified nature and the countryside. By the second half of the 19th century, travel to the countryside had become an extremely popular activity. Areas formerly shunned as ugly undeveloped wastelands, such as mountainous or forested regions, suddenly became the awesome "Nature," beautiful to look upon and purifying to the soul.

With the expansion of the American elite during the early 20th century and their search for a place to escape from the cold winters of the north, an increasing number traveled to the warmer winter climates of Florida and the Caribbean. This movement toward sunnier climes was enhanced at about the same time by the medical profession which pointed to healthful effects of exposure to sun. As a result, suntans became popular and even the most reticent no longer shunned nature.

Another major factor promoting tourism in the early 20th century was the perfection of the automobile. With this development, tourist transportation was suddenly altered from largely a group activity to an opportunity for individual travel.

Probably no other single technological development has affected tourism to the degree that the automobile has. It had the additional advantages of being more convenient, faster, easier, and cheaper than any other means available.

All of these developments broadened tourist opportunities to an extremely wide cross-section of the population. Tourism experienced a kind of democratization where virtually everyone could participate. Increased interest in the outdoors and the cheap, rapid means of travel provided by the automobile had as their consequence the popularization of automobile touring, tent camping, and trailer camping (caravanning) holidays, all forms of recreation which tend to ignore the traditional resort accommodations of the 19th century.

Modern forms of "nature tourism" essentially reflect a philosophical continuity with the romantic ideals of the Victorian era. Such ideals placed a higher value on the concepts of "natural" and "free" in contrast to the scientific-mechanistic cosmology of the Renaissance and the Industrial Revolution which valued the "artificial" and "controlled." From these views sprang the environmental preservation ethic to the point where late-20th-century tourism is essentially a form of environmental pilgrimage. The romantic philosophy was accompanied and reflected by the 19th-century development of the "park concept" (Haines 1977a:156–173), a movement that culminated in land being set aside from commercial or residential development for the purpose of creating park lands. The highest form of park lands is the National Parks, locations which may be conceived as the "sacred sites" of environmental tourism. These locations, characterized by great scenic beauty or natural wonders, represent the physical embodiment of modern preservation ideology and provide focal points for contemplation by environmental tourists.

Characteristics and Structure of Tourism

The character of tourism is multidimensional in that it is composed of many interdependent elements. In order for the system to function adequately, cooperation and coordination between its various facilitators (tourist centers, hoteliers, tour operators, etc.) is required. At the same time, each of the elements has the potential to exhibit widely differing economic performances. Any weak link in the system can adversely affect other elements, which under different circumstances would be economically healthy (Robinson 1979:xxx–xxxi; Crick 1989:315).

A major characteristic which affects the overall nature of the business of tourism is that, unlike other "industries," it is primarily a service industry. It has no tangible product to export and, as a result, its work force is composed of large numbers of people employed in tertiary occupations (catering, travel agencies, etc.). The majority of employees in this system usually occupy very marginal positions and receive minimal wages in return for their labor. These qualities of marginality are enhanced by the often distinct (usually seasonal) rhythm of each tourist area and industry. As a result, casual work and seasonal unemployment are frequently the distinguishing features of an economic system based on tourism (Robinson 1979:xxxi).

Finally, tourism is dynamic in its undertakings. This is because it is basically an enterprise which is governed by changing ideas, attitudes, and fashions of the tourist

population. These various elements can change within very brief amounts of time and may be radically different from one region to the next. As a result, businesses pursuing the tourist trade must be able to adjust rapidly to new conditions in order to survive over the long term (Robinson 1979:xxxi, 40).

The structure of "tourism" is often conceived of as basically composed of three sectors (Robinson 1979; Cohen 1981; Nash 1981; Crick 1989). Obviously, the first of these must be the *tourist*. This potential pool of tourists includes the entire range of society representing both sexes, all ages, social classes, social structures, interest groups, etc. Each of these characteristics theoretically anneals in a variety of ways to form specific tourist interest groups and subgroups. A great deal of discussion in the social sciences has been leveled at defining the tourist. In this chapter, a tourist is anyone who undertakes voluntary travel which tends to be nonrecurrent and is specifically oriented toward the pursuit of novelty, change, and/or the intangible (includes philosophical and religious motivations). The character of the travel can be extremely broad, the goals and activities varying according to distinctions of class, ethnicity, and national origin as well as by age, sex, and personality.

The second sector of tourism is the *external facilitator*. This includes the entire assemblage of tourist support organizations and facilities which lie outside the targeted tour areas. The external components have a variety of functions. They identify potential interest groups within the tourist population, form the commodity to be provided, create a motivation of demand or otherwise execute a marketing strategy to encourage visitors to travel to the targeted tourist location and activities, and supply transportation and other support services which enable the tourist to move to and from the commodity.

The third and last sector or element of tourism is the *internal facilitator*. This includes all facilities supporting the tourist within a specific tour center. Included in the internal component are one or more organizations which have a broad spectrum of obligations. Among these are transporting visitors from one focal point in the tour center to the next, developing and maintaining food and lodging facilities, and providing all other ancillary services required or demanded by the tourists while in the vacation area.

Tourism Model

Dynamics of Cultural Tourism

Yellowstone National Park can be conceived of as composed of two interactive and dynamic systems, the "natural system" and the "cultural system." The "natural system" includes all geothermal properties, topographies, climates, flora, fauna, and various interactions of these elements. It includes not only those which are extant in the park today, but also those which existed in the past.

Overlying and interacting with the natural system is the "cultural system." One of the more conspicuous aspects of this system is the manner in which it ranks the

relative importance of various natural features in Yellowstone National Park. Currently, the most important of these is Old Faithful Geyser although there is some evidence that the Grand Canyon of the Yellowstone and the associated Upper and Lower Falls received that accolade during earlier portions of Yellowstone's history. Aside from these, other major natural features in the park historically include Yellowstone Lake, Mammoth Hot Springs, and Norris Geyser Basin. Among the park's secondary features are such locations as the Fountain Paint Pots, Gibbon Falls, the Mud Volcano, and Tower Falls. Each of these natural features once held greater or lesser cultural prestige at different points in time during the park's history. Some, like the Natural Bridge (Whittlesey 1988:111), are almost unknown to the modern park visitor.

Another prominent aspect of the Yellowstone National Park's cultural system is an ideological component that is essentially romantic in its perspective. This view essentially holds that the park is more or less unspoiled by the artifice of human hands. It serves historically as the factor upon which the park was established and represents a perspective that continues to be the foundation upon which the park is visited today (the "Natural Park Myth"). Yellowstone's landscape incorporates an extensive and complex network of artifice which can be called Yellowstone's *cultural system*. This system is essentially one founded upon the aspiration of the government and the capitalist entrepreneurial system to create and facilitate a tourist commodity. This is accomplished, in part, by focusing the attentions of the various tourist publics upon a natural resource. The focus on "the natural" is accomplished through "the cultural;" that is concentrating the park's various developmental and maintenance resources in the immediate vicinity of the natural resource. At any one time, those elements of the natural resource which are perceived of or promoted as "primary" receive the greatest construction and development funding. Those identified as "lesser" natural features receive progressively less attention and funding depending upon their relative position in the scale.

These actions have resulted in a process of ever expanding access to the park's various natural features through time. At one extreme of the access scale was the virtual lack of access to any of the park's features at the point of the park's creation and for a number of years thereafter. As access was increased through time, more of the park became available to visitors for 2–3 months of summer. This process has now progressed to the point of virtually unlimited access to all of the park's natural features during the warm months of the year. At present, with access to the park by automobile, bus, snowmobile, and snow buggies, all primary and most secondary natural features on the modern Grand Loop Road are now within the purview of the modern tourist the year around.

System Components

Tourism was described earlier as an "industry" composed of three major systems: the tourist, the external facilitators, and the internal facilitators. The tourist subsystem is hypothetically composed of at least three socioeconomic groups; low, middle, and upper classes. Each of these groups has different expectations, demands, and

financial resources which in turn encourage and assist in the development and support of differential, class-based entertainment activities and tourist facilities. External facilitators include all those agencies which identify a potential tourist area, promote its attractions, and provide the transport of goods and tourists to the tour center. Internal facilitators are those agencies which protect and maintain the tour center; supply basic services of food, lodging, and internal transportation; provide entertainment opportunities; and furnish materials and goods desired by the tourists during their stay. Each of these systems and subsystems interact to various degrees, enhancing or diminishing one another according to the overall nature of their interactions at any one time.

The Tourists

Tourists are the natural focal point of Yellowstone cultural activities as the park was created to be their "pleasureing-ground." It is critical to understand, however, that the role of the tourist in park development and management is not simply reflexive. Instead, the tourist plays a very subtle but direct role through his or her attitudes, expectations, and perceptions of the effectiveness of park management and whether development in the park meets his or her needs. These attitudes, expectations, and perceptions can (and often do) result in political pressure of various types and degree. The public's perceptions of the concessionaires tend to be passed on to park management, particularly when the perception is negative. Similarly, the park management's competence to preserve the park's wonders or control the concessionaires is often communicated to the tourists' representatives in the Congress. Since the structure of park management has always been determined through the political process, tourists have the potential to greatly influence the actual form and goals of such management.

The tourist more directly influences the various tourist support facilities outside and inside the park. The scale and direction that such influence takes is predominantly a factor of the range of economic status inherent in the tourist population, age and sex composition, and their corresponding leisure time. These mechanisms, for example, restrict and define the locations visited and their lengths of stay. They also restrict and define the range of tourist expectations when they visit the vacation area and these are reflected in turn by the "quality" and type of accommodations/tourist support facilities provided as well as the activities made available for them to participate in. In other words, each socioeconomic, age, and sex combination exhibited by a particular body of tourists is likely to have different minimum facility requirements.

External Facilitators

External facilitators include all those agencies which identify a potential tourist area, promote its attractions, and provide the transport of goods and tourists to support the

"industry." These elements of tourism can be, by definition, only indirectly reflected at Yellowstone for they encompass those agencies, both public and private, which support the park activities from outside the park's boundaries. These may vary in distance from immediately beyond the park perimeter to locations thousands of miles from the park.

External Transportation

Since tourism is basically a travel industry, transportation represents one of the more critical elements in this system both inside and outside the park. Tourist visitation is enhanced by a transportation system which is fast, dependable, and relatively economical. The scale and character of tourism at Yellowstone is dependent on a number of variables which are primarily technological in nature.

One of the more critical variables would appear to be the type of "road," whether it be paths, horse trails, wagon roads, railroads, or various categories of highways. In general, the type of road determines the other variables of importance, such things as length and location of routes, type of conveyances which may be used, and the degree of access (number and types of travelers) to the natural, scenic resources.

External transportation modes are of particular importance to Yellowstone tourism because of the park's remote location with regard to major population and supply centers. Historically, travel to and from the general park area was essentially provided under two auspices: private capital and government-funded construction projects. Private capital was particularly important during the early history of the park as governmental bodies at that time rarely engaged in road construction and never provided the means of conveyance to or from the park. Among the products developed by private capital to enhance tourist access to the park were railroads, various forms of horse-drawn and motorized conveyances, and roads and bridges of differing degrees of sophistication. Often, privately constructed roads and bridges used to access the park were built for a variety of other economic reasons (usually to access ranching or mining communities), with promotion and profit from tourism generally being of relatively minor importance. Reimbursement of individuals, companies, or corporations responsible for their construction was through revenue in the form of tolls levied against individuals traveling through the region and freighters hauling supplies to and from mining camps or other small regional communities. Similarly, railroads were constructed as a means of moving people, goods, and materials from one place to another and serving as an inherent element within an extremely diverse spectrum of economic activities taking place on a national scale. Most side spurs from the main track were more limited in economic and areal focus. For instance, those constructed to the park boundaries accommodated small communities oriented to ranching and mining with a major economic focus on enhancing the railroad revenues through tourism.

The modes of transporting people to and from the park had a great effect on the nature and scale of the services provided inside the park. For instance, prior to the Northern Pacific Railroad completing a spur branch of its lines to the park, most tourists were required to provide their own transportation. This could be

accomplished through one's own transport (wagon, horse, etc.) or through the rental of such conveyances at small towns in the region. Visitation remained low and tourists were largely derived from the local populace. As a result, inner park services remained at a very low level consisting largely of a few crude hotels, only some of which occasionally provided meals. As the Northern Pacific spur line approached Yellowstone, access to the park by non-local tourists was enhanced. Most were relatively affluent and expected better accommodations than could be had heretofore. They also required the development of an internal transportation system to move them from one awe-inspiring location to another (Haines 1977a, b:Chap. 9–11, 15). The incentive was there for entrepreneurs to provide increasingly luxurious accommodations and create internal stageline systems.

From the late 19th century on, road construction outside of the park was increasingly initiated by various governmental entities (see National Park Service 2003:E4–E15). Local, state, and federal governments built roads and bridges to enhance the economic development of their respective geographical spheres. When government involvement was coupled with the advent of the automobile, the nature of tourism inside and outside the park changed completely. Virtually everyone could provide his or her own transportation to the park and the park's resources were made available to a much broader spectrum of the nation's populace. Tourist support facilities became more democratic as a result, providing a diversity of hotels, restaurants, campgrounds, and activities suitable to every sector of the tourist populace (Haines 1977b:Chap. 22; Robinson 1979:19–20; Graburn 1989:30–31). Immediately after World War II, the transformation of park tourism had been completed. The railroads dropped out of the tourist transportation business and the large hoteliers were reduced to lesser roles in the overall range of tourist support facilities.

External Support and Supply

These agencies provide goods and materials necessary for internal tourist-oriented businesses as well as those necessary for internal park management. They include businesses at considerable distances from the park to the point that, in some instances, these may be international entities. They also include businesses located at the margins of the park which furnish support facilities (lodging, supplies, food, etc.) for the tourists immediately before and after their sojourn in the park. Major factors regulating the scale of involvement on the part of these agencies are transportation technologies, tourist expectations and demands, the scale of internal tourist support facility development, and degree of government regulation of such businesses. Since these agencies lie outside the physical bounds of the park while, at the same time, are often dependent upon the park (either wholly or in part) for economic survival, the potential is very great for conflict to arise between internal and external elements of Yellowstone Park tourism.[11]

Internal Facilitators

Internal Transportation

As noted earlier, transportation may be one of the most important elements contributing to the success of a tourist-based enterprise. This fact was recognized by the park's various management entities, especially those involved in road construction.[12] For the first half of the park's history, its managers engaged directly in the development and maintenance of roads and trails throughout the park (see Culpin 1994:Chap. I–VII; Haines 1977a,b:Chap. 9 and 17). These were aptly considered to be a vital means of encouraging Yellowstone visitation as well as promoting the preservation and maintenance of the natural "wonders" placed in the care of park managers.

The scale and character of tourism at Yellowstone reflects the variable nature of its transportation system. This includes not only the routes but also the technologies used in the transport vehicles. The routes in Yellowstone were somewhat more restricted than those outside its boundaries. Routes include footpaths, horse trails, wagon roads, and (as of 1915) various classes of automobile roads and highways. As noted earlier, the technologies available to create the routes determined their length and location, types of conveyances, rapidity of movement, and the degree of access (number and types of travelers) to the natural, scenic resources. The importance of the transportation system cannot be overstated for the mode of transportation is the primary element influencing the availability and positioning of tourist accommodations and other support facilities in the park.

Internal Support and Supply

This element of tourism can be severely restricted and constrained by all of the other elements. This is certainly true in the National Parks where all such activities are undertaken by concession companies under contract with the government. These concessionaires require governmental approval and licensing to operate in the park. They must meet certain performance standards in order to continue operation and meet certain political expectations as well. In order to survive economically, concession companies must be able to identify the kinds of attractions which will draw the public to the vacation area. Where the parks are concerned, the attractions are often defined by or are in conjunction with the governmental agency. Once the attractions are identified, the companies must construct and/or otherwise provide support facilities for the tourist which are necessarily based on at least two variables beyond their control; i.e., the routes of travel provided by the managing government agency and the types of facilities expected by tourists. With regard to the latter, the successful concessions entity must also be able to recognize the changing demands of tourists by closely following the fashion and trends of the industry. Not only must it recognize these demands but it must then be able to adjust its business in ways to allow it to successfully address them. Finally, this tourist element must be sure that the tourists have access to the necessary conveyances for transporting tourists and

supplies to the vacation locale. At Yellowstone, this has been accomplished through transportation companies which are either independent of or variously integrated with the companies providing food and lodging.

Park Management

Historic accounts have demonstrated that the form that park management takes is based on public political expectations, its demonstrated and perceived performance, and the cost of instituting and operating that particular form of management. National Park management has a number of responsibilities which it must fulfill, based on the mandates of law and policy. Primary among these are (a) the construction and maintenance of internal access routes (roads and trails), (b) the protection and preservation of the park's natural and cultural resources, and (c) the regulation of concession activities.

Application to Yellowstone National Park

Parameters of the Model

This model of Yellowstone tourism was developed only for that period starting from the time of the park's inception through the initiation of World War II. This span of time, from 1872 to December 1941, was selected for a variety of reasons. The time frame obviously represents the majority of the park's historical era. The preponderance of historic archeological sites can similarly be expected to have been created, occupied, and abandoned during this era. As well, all sites created during this period are old enough to be evaluated for significance and eligibility for the National Register of Historic Places. It is also true that the area in general had no organized tourist infrastructure prior to the creation of Yellowstone National Park. This establishes the year 1872 as the natural initial date for the model. Similarly, World War II presents the researcher with a natural terminus for investigation in that the park had virtually no visitation during that period. All concessions ceased operation and the park's infrastructural elements deteriorated from a lack of attention as a result of warfare funding diversions. For all practical purposes, Yellowstone ceased to function as a National Park for the duration of the war. This terminus is also chosen because of the radical transformations in park tourism which took place following the war. Among the changes were the discontinuation of railroad transportation for tourists; an almost total dependency upon the automobile for access to the park; initiation of Mission 66 which completely restructured the way the park was managed and the manner in which concessions were operated; weakening and eventual bankruptcy of the major concessions operator (Yellowstone Park Co.); relocation and rebuilding of the park's hotel and camping facilities; and a volume of tourist traffic that involved millions of people (over 1 1/2 times the peak pre-war volume).

A review of Aubrey Haines' (1977a, b) history of Yellowstone National Park suggests only two things remained the same throughout the period of concern. The first was the period of tourist visitation. The tourist was essentially a short-season visitor, with most of the visitation occurring essentially between June 1 and September 30. The second constant was the continually changing nature of tourism itself. The entire 70-year-period under review is characterized by continuous innovation and transformation with regard to all aspects of park management, transportation, and concessions. Often these developments occurred virtually in concert with one another, with a major change in one aspect having a ripple effect leading to rapid adjustments in other portions of the tourist system.

From this perspective, Yellowstone National Park's development and tourist history is seen from a more organic approach where various interacting cultural systems operate and change as a body. This is in contrast to a perspective where each aspect of park and tourism development is considered as an isolated entity. The approach taken is a more comprehensive view of change which allows one to view Yellowstone tourism as an evolutionary process. The particular events of that process in Yellowstone National Park can be characterized as a series of temporal periods. Each of these periods exhibit unique antecedents, internal components, and component interaction spheres. Based upon these considerations, four periods of Yellowstone tourist development are defined.[13]

Period I, Nascence (1872–1882)

Defining Characteristics

The defining characteristics of this period are multiple. The period was initiated, of course, with the establishment of Yellowstone National Park as an entity of the federal government under the authority of the Department of the Interior. Unfortunately, the park's management was relatively weak and ineffectual throughout the period, a factor of some importance when one considers Yellowstone's relatively lawless frontier location. Although tourist facilities actually preceded the establishment of the park by a year or so the park witnessed a very incipient development of tourist facilities throughout Period I. Tourism during this period was primitive in all senses of the word with few facilities or organizational structures in existence with tourists essentially left to their own devices as far as touring and accommodations were concerned.

The Tourists

Tourism was virtually negligible throughout the period. However, given the problems of access and the crude conditions the tourist had to endure after arriving, the small volume is really not surprising. Estimates for the number of people visiting Yellowstone National Park are not very accurate but it appears that they varied from around 300 at the beginning of the period to around 1,000 per year by the end of

Period I. The composition of the park's tourist population appears to have been extremely restricted as well with two general groups recognized. The predominant group was composed of people from a variety of social classes that resided in the immediate Yellowstone region. Those in the second group were extra-regional travelers of American or foreign extraction, usually of some social prominence, with the necessary wealth and leisure time to allow opportunities for recreating at great distances from their home.

External Facilitators

External Transportation

Aubrey Haines has noted that "Yellowstone National Park was practically inaccessible" especially during the early portions of this period.[14] *Routes* consisted of roads and trails which were largely informal in character; that is, established according to custom. These included trails established by Native Americans, trappers, miners, etc., as well as a few somewhat more formal roads and bridges built primarily by private individuals (e.g., the Baronett Bridge). Some of the external roads near the park boundaries, especially on the north side of the park, were created through the efforts of park management as a means of encouraging tourist visitation.

Conveyances

Conveyances, as one would guess, given the conditions of the transportation routes, were relatively limited in form. Transport to the park was via a variety of modes depending upon one's point of departure. Among these were railroads, steamboats, wagons and buggies, stage coach, and horseback. No mechanized forms of transport were available to bring the tourist anywhere near the park and travel to and from the area was a matter of weeks to months depending upon the traveler's starting point.

External Support and Supply

As with internal support and supply (see below), this aspect of Yellowstone tourism was primitive at best and nonexistent at worst. Sources of supply were relatively distant from the park. Those seeking supplies had to travel for several days to Bozeman or Virginia City (or Livingston at the end of the period) returning all supplies to the park via pack train or wagon.

Internal Facilitators

Internal Transportation

Routes of travel, either formal or informal, were almost nonexistent at the initiation of this period. All travel took place on horseback over trails similar to those outside the park boundaries. Park managers initiated the construction of trails, crude roads, and bridges during this era which aided park access to some degree. Nevertheless,

such roads as did exist by the end of the period were little more than strips cleared of trees with little attention paid to landscaping, contouring, or otherwise improving the road beds.

Conveyances

Routes through the park were so crude that the tourist had no other choice than to travel by pack train until around 1878 (Fig. 1.1). After that point in time, the routes were improved somewhat – at least to the point where the tourist could choose to use horse-drawn wagons and buggies if they so desired. Conveyances could and were usually owned by the tourist although options for renting wagons, buggies, and horses from regional businesses increased throughout the period as small towns sprang up around the margins of the park. Of some importance among the latter were Livingston and Bozeman, Montana.

Fig. 1.1 W.H. Jackson, packing a mule while traveling through Yellowstone in 1871 with the Hayden surveys, just prior to its establishment as a National Park (NPS Photo by William H. Jackson, 1871)

Internal Support and Supply

Internal support and supply for the tourist was almost nonexistent. Where it could be found, tourist facilities were as primitive as the other tourist-based elements of the model discussed so far. Most people traveling to and through the park camped along

their line of travel with camp locations being unique to each individual or group as weather conditions and daily events for each touring body dictated.

Crude log or frame structures providing minimal accommodations were used as hotels and bathhouses, although these were extremely rare and had very little in common with most hotels in other areas of the United States. These facilities were owned and operated by frontier entrepreneurs as no large-scale organization providing tourist accommodations existed until the very end of the period. At the beginning of the period, only one of these rude "hotels" existed. This was McCartney's Hotel at Mammoth Hot Springs, which lay along the most accessible avenue into the park (Fig. 1.2). This facility provided no amenities other than crude baths and simple, unvarying, and poorly prepared meals. Guests were required to sleep on the floor and had to supply their own bed rolls. By the end of the era, an additional crude hotel existed in the northern end of the Lower Geyser Basin. This was the Marshall House, established in 1880, at the crossroads of the Norris Road and the Virginia City Freight Road.

Fig. 1.2 McCartney's Hotel at Mammoth Hot Springs was the first hotel in the park (courtesy Montana Historical Society, photo by F.J. Haynes)

Once inside the park, tourists had to rely on their own resources for sustenance. All food other than meat had to be purchased outside the park and brought in by pack train or wagon. Fresh meat was acquired by hunting the park's game animals as no other sources existed and the practice was not discouraged by park management.

Park Management

Park management throughout this period was a civilian entity. There was unfortunately no continuity of action or structure to this management through the period. Instead, management was marked by constant change and reorganization, with none of the restructuring efforts resulting in an effective supervision and protection of the park's resources. This was due in part to the lack of regulations for operating the park but was predominantly a factor of small park budgets and the almost total lack of authority granted to park managers by the Congress or the Secretary of the Interior. The constant restructuring and reorganization was largely an effect of dubious political interference. It represents, in part, management by trial and error and, as such, would seem to reflect a learning process of how to run a national park.

Despite these problems, there were some positive accomplishments on the part of the park managers during Period I. The most prominent of these was the construction of the crude Norris Road and trails between 1877 and 1881, an action which improved park transportation considerably during the latter half of the period. If the federal government in general can be considered "the management," one may also point to the continued documentation of the park via survey parties as a positive action. Such activities were usually carried on independent of the park superintendent and were largely military enterprises. Included among them were the Hayden surveys (1871–1872), the Jones expedition (1873), the Ludlow expedition (1875), and the Doane expedition (1876–1877).

Termination of Period I

The end of Period I is marked by a number of improvements in transportation, internal support and supply, and external support and supply. No obvious changes occurred in the pattern of tourist visitation or park management by 1883.

Identified and Expected Archeological Resources

In comparison to later periods, Period I should have few archeological sites represented with those that do exist demonstrating a restricted functional range as well. At this stage of park development, 23 site functions are associated with Yellowstone tourism.[15] A preliminary review of the archeological data suggests 12 sites have been formally recorded (Table 1.1). Most are associated with road or road construction ($n = 8$) with only one site, a bathhouse, associated with tourists. That facility was never completed, however. One pre-park settler cabin and bridge has been recorded and two sites associated with park management are known although only one, Soda Butte (assistant superintendent's) Soldier Station, has been investigated to any extent. Note the almost total lack of support and supply sites. Only one of two rustic hotels known for this period (McCartney's Hostelry) has been recorded. The location of the other site, the Marshall House, is well known but has not been recorded to date. More focused archeological research is required to

Table 1.1 Yellowstone National Park, Period I (1872–1882): archeology sites associated with tourism

Theme	Subtheme	Anticipated site function	Recorded sites	Reference
Internal transportation	Route	Trail		
		Road	48YE16, Mammoth-Clarksfork Road	Johnson 1989a
			48YE135, Snow Pass Route, Mammoth to Norris	Sanders et al. 1996d
			48YE821, Cooke City Miner's Road	Sanders et al. 1996a
			48YE89, Cooke City Miner's Road cairn (route marker)	Sanders et al. 1996a
			48YE772, Norris Wagon Road	Hunt et al. 1994
			48YE781, Mary Mountain Road	Hunt et al. 1994;
		Bridge, structures	48YE685, Baronett Bridge and House	Johnson n.d.; Ayres 1989
	Road construction	Camp		
		Storage structure	48YE783	Hunt et al. 1994
		Garbage dump/scatter		
	Conveyance	Stage station		
		Barn/corral		
		Garbage dump/scatter		
Tourist	NA	Informal camp site		
		Garbage dump/scatter		
		Bathhouse	48YE8, Queen's Laundry Bathhouse	Wheaton 1989
		Garbage dump/scatter		

Table 1.1 (continued)

Theme	Subtheme	Anticipated site function	Recorded sites	Reference
Support and supply	Accommodations	Rustic hotel	48YE804, McCartney's Hostelry	Site form
Park management	Government management	Mammoth HQ structure		
		Superintendent's House	48YE689, Norris Residence	Site form
		Assist. superintendents' cabin	48YE88, Soda Butte Soldier Station	Karsmizki 1998; Sanders et al. 1996a
		Exploratory parties tent camp		
		Garbage dump/scatter		
	Prohibited activities	Poacher cabin		
		Poacher encampment		
		Butchering station		
		Garbage dump/scatter		

locate the quantities and varieties of sites to allow comparisons with those of disparate function within Period I as well as comparisons with sites of similar function from later other periods.

Period II – Transition (1883–1892)

Defining Characteristics

The defining characteristic for Period II is continued improvements in all aspects of the tourist infrastructure. Routes were greatly improved outside the park and, to a much lesser degree, inside as well. Transportation companies were formed to move people to and through the park with the number of tourists visiting Yellowstone National Park increasing slightly as a consequence, although the overall rate of visitation remained rather low. As well, little variation appears to have taken place with regard to tourist socioeconomic or geographic characteristics. Lodging facilities increased somewhat in number and sophistication with at least some sort of food and lodging available at all major points of interest. Finally, the troubles witnessed in park management during Period I resulted in the government handing the reins of power over to the US Army during this period.

The Tourists

Tourist volume increased slightly to thousands of individuals per year (range = 1,000–6,000). The people coming to Yellowstone probably had essentially the same socioeconomic and regional characteristics as those of Period I. The greater portion of park tourists at the early end of this period probably remained working and middle-class people living in immediate Yellowstone region. Enhanced transportation capabilities outside the park (see below), however, may have increased the percentage of extra-regional travelers somewhat with two potential groups participating in Yellowstone tourism. This extra-regional group may have included wealthy travelers with considerable leisure time but also more middle-class extra-regional visitors to the population of Yellowstone tourists.

External Facilitators

External Transportation

External modes of transportation improved greatly during this period as the Northern Pacific Railroad completed its connection to the West Coast in 1883 and, shortly thereafter, a park branch line to the new town of Cinnabar near the park's north entrance. This development had two effects. First, it placed regional consumers (including those at the park) within a truly national economy for the first time. Consumer items could and probably were derived from both coasts and could be brought to the park in rather significant amounts in contrast to the previous period. It is not known to what degree the towns of Livingston, Bozeman, and Virginia City

continued to serve as mercantile sources for goods and material but it is likely that their influence was dampened considerably. On the other hand, it seems likely that the small towns such as Cinnabar played a larger role in provisioning the tourist and supplying the area with mercantile goods through their various local business establishments.

The second major effect of the completion of the Northern Pacific Railroad is that it allowed immediate and easy access to the park by large numbers of tourists from both coasts. This set the stage for further development of tourist businesses inside and near the park.

In addition, external transportation was enhanced as more formal roads were constructed, improved, and maintained. These were almost wholly individual actions and undertaken, for the most part, as a means of improving the movement of goods and supplies to regional mining and ranching communities. Nevertheless, the government (via the military) did initiate some road construction. The purpose of these roads was not the promotion of tourism but to acquire and secure control over Native American movement and lawless EuroAmericans. With the development of new roads and improvement of existing thoroughfares, an elaborate system of stagelines was quickly developed which allowed the traveler to reach the park via southern and western entrances after traveling by railroad lines other than the Northern Pacific.

External Support and Supply

This aspect of tourism showed great improvement, increasing and diversifying primarily as a result of the continued expansion of the Northern Pacific Railroad westward across the country. Distant sources of support and supply were more easily accessed via this transportation system allowing larger quantities and more diverse kinds of goods, supplies, and materials to be brought inside the park boundaries. The predominant source for such goods would be the eastern metropolitan cities. Somewhat nearer, Bozeman and Virginia City continued to serve as major but relatively distant sources of supply. However, the period also witnessed the establishment of a number of new towns (Livingston and Gardiner, established at the end of Period I, and Cinnabar during Period II) near or at the park boundaries. These centers allowed tourists to replenish supplies and obtain services much closer to the park. They also served as secondary sources for the replenishment of supplies to park businesses and managers.

Internal Facilitators

Internal Transportation

Internal transportation routes were improved although not to the degree exhibited outside the park. The major accomplishment marking the initiation of Period II was the completion of Superintendent Norris' road-building efforts. With completion of the Norris Road, little additional action was taken throughout most of this period, other than small-scale road realignments and improvements. At the end of

the period, a newly installed military management initiated construction of the road system which eventually evolved into the "Grand Belt" or "Grand Loop Road.".

For most of this period, little change occurred with regard to conveyances inside the park. Travelers continued to be left to their own devices for transportation needs. Rental of buggies, wagons, and horses could still be had in surrounding communities. By the end of the period, road improvements inside the park were such that a system of stagelines was finally established. This provided the hotel companies with the ability to provide regular, organized park tours for the first time. In 1883, the first commercial tourist transportation system was initiated by the Yellowstone Park Improvement Company in concert with Wakefield and Hoffman Company. The two companies jointly built stables and corrals at Mammoth Hot Springs, with Wakefield and Hoffman subsequently adding similar facilities "at each of the geyser basins, Lake, and the Falls" (Culpin 2003:31). From these points, tourists could rent saddle horses or access an intra-park stageline. Previous stagelines operating in Yellowstone (the Bassett brothers, Gilmer and Salisbury, and George Marshall's stage company) were based outside the park and provided much more limited services and access to the park's wonders (Yellowstone National Park Archivist Lee Whittlesey March 10, 1994, personal communication).

Internal Support and Supply

Internal support and supply slowly improved but fairly primitive conditions persisted until almost the end of Period II. Camping and self-supply of meat from park game animals continued to be the rule for most park visitors. With the completion of the transportation network (Norris Road) in the park, the way was opened for the creation of tourist hotels and transportation companies.

Accommodations remained somewhat crude at the initiation of this period, the few in existence essentially consisting of log structures or tent camps. As the period progresses, however, a variety of accommodations became available to suit a broader range of tastes and pocket books. Hotels of various kinds essentially followed the new and improved roads with lodging and meals available at all major tourist stops in the park. Intermediate priced hotels (largely simple frame structures) and lesser grade accommodations were positioned at each major tourist stop. Period II also saw the construction of the National Hotel at Mammoth Hot Springs, the first "grand" or elite tourist hotel in the park (Fig. 1.3).

In general, tourist businesses throughout Period II demonstrated a slight tendency to move from individual to corporate ownership; a pattern which has strengthened through Yellowstone's history. The common feature of Period II concessions was competition among a number of independent companies with some slight propensity toward coalescence throughout the period. Although ownership of each tourist hotel was largely by one or two persons, a "syndicate of wealthy gentlemen" connected with the Northern Pacific Railroad created the Yellowstone Park Improvement Co. in 1882. This was the first large-scale tourist-oriented enterprise in the park. This company initiated a program in 1883 to improve the available lodging in the park with regard to both kind and number, supply guides and tours, establish a stageline

Fig. 1.3 The National Hotel at Mammoth Hot Springs as it appeared after its completion in 1883 was the first hotel designed to accommodate wealthy Yellowstone tourists (NPS Photo, photographer unknown)

from the railroad to the park, and operate a steamboat on Yellowstone Lake (Culpin 2003:9–10). Despite the general improvements in facilities, tourist businesses in general tended to falter or fail altogether throughout this period. This may have been due, in part, to a general lack of knowledge about how to run such far-flung, complicated enterprises. More likely, the problem was a function of the continuing low park visitation rates.

Improvements were also made in the availability of victuals. Prepared meals became increasingly available in the park as the period progresses. The practice of hunting the park's wild game animals decreased substantially, however, as military managers enforced protection of park animals. Tourists and tour companies were forced to turn to sources outside the park for meat. These outside sources include both game animals and beef and pork derived from local ranchers.

Park Management

Period II was increasingly marked by the intrusion of special interests into park management and management policy. Flagrant collusion by park superintendents with commercial tourist interests resulted in the park being placed under military authority in 1886 (Fig. 1.4). Park headquarters were maintained at Mammoth with the Army's establishment of Camp Sheridan. Orders of the camp commander finally provided some protection for and control of the park's natural resources.

Fig. 1.4 Company M, 1st US Cavalry, from Fort Custer, Montana Territory, marching into Mammoth Hot Springs, 1886 (NPS Photo, photographer unknown)

Termination of Period II

The end of Period II was marked by continued improvements in the transportation system inside the park and expansion of tourist services. A major development at the end of the period was the consolidation of major tourist-based companies under the umbrella of Northern Pacific Railroad as a means of stabilizing and controlling the tourist hotel and transportation business. Otherwise, such tourist system elements as the park management and external support and supply continue much as before. Tourist volume increases radically and accumulations of imported items for tourist purchase or use show an equally dramatic escalation.

Identified and Expected Archeological Resources

The number of historical archeological sites in Yellowstone National Park should increase substantially in number and function when compared with those in Period I and the functional range of those sites should become broader as well. A review of the literature suggests at least 31 potential site functions are anticipated, a preliminary review of the archeological data suggests only 21 sites have been formally recorded (Table 1.2). Almost half ($n = 9$) are associated with road or road construction, with only two sites associated with tourists (a hotel bathhouse and a petroglyph consisting of initials carved into a geyser). Internal support and supply for tourists is greatly expanded during this period with seven sites recorded. Four are hotels (one a lunch station) and one of these, the Lake Hotel, was built at the end of the period and represents the first of the next generation of luxury hotels that would rise in Period III. Only three sites associated with park management are recorded, with only one, Soda Butte Soldier Station, investigated to any extent. The literature suggests many more with this theme should occur within the park. More focused archeological research is required to locate the quantities and varieties of sites to allow comparisons with those of disparate function within Period I as well as comparisons with sites of similar function from later other periods.

Period III – Diversification and Expansion (1893–1915)

Defining Characteristics

Period III may be characterized as one where tourist services were greatly expanded, became highly diversified, and increased in overall complexity. All this activity was paralleled by an on-going process of consolidation of businesses supplying similar tourist services in the park. In general, management resources and internal tourist facilities were targeted toward a broader touring public as methods of operating became well-established. This was accompanied by the consolidation of major tourist-based companies under the umbrella of the Northern Pacific Railroad to operate tourist hotels and transportation companies.

The Tourists

The volume of tourists continued to increase throughout Period III with about 6,000 people per year at the start of the period and about 36,000 per year by its end. This period is also notable for the fact that the population of tourists to Yellowstone expands considerably in its composition (Fig. 1.5).

In general, there appears to have been three major groups. The first of these was the autonomous traveler. For one year in this period (1897), this category of tourist utilized approximately one-half of all vehicles traveling through the park. In addition, there were at least 235 people hiking or bicycling through the park rather than taking the organized tours. The category of autonomous traveler actually embodied two types of tourist, the “sagebrusher” and the “independent.”

Table 1.2 Yellowstone National Park, Period II (1883–1892): archeology sites associated with tourism

Theme	Subtheme	Anticipated site function	Recorded sites*	Reference
Internal transportation	Route	Trail		
		Road	48YE16, Mammoth-Clarksfork Road	Johnson 1989a
			48YE774, Fountain Freight Road	Hunt et al. 1994
			48YE781, Mary Mountain Road	Hunt et al. 1994
			24YE17 and 48YE821, Cooke City Miner's Road	Sanders et al. 1996a
			48YE520, Mammoth to Norris Road	Sanders et al. 1996d
			48YE786, Corduroy Road	Hunt et al. 1994
		Railroad	24YE15, Northern Pacific RR grade	Haines 1997b; Daron 1995
		Bridges, culverts, etc.	24YE149, Madison R. bridge	Sanders and Wedel 2003a
	Road construction	Camp*		
		Quarry	48YE125, gravel pit	Sanders et al. 1996d
		Garbage dump/scatter		
	Conveyance	Stage station		
		Barn/corral		
		Garbage dump/scatter		
Tourist	NA	Informal camp site		
		Bathhouse	48YE773, Marshall/Firehole Hotel	Hunt et al. 1994; Hunt 1993b

Table 1.2 (continued)

Theme	Subtheme	Anticipated site function	Recorded sites*	Reference
		Petroglyph	48YE9 (carving in geyser feature ca 1910?)	Beal 1960; Johnson 1988b
		Garbage dump/scatter		
Support and Supply	Accommodations	Log cabin/tent/rustic hotel	48YE428, Yancey's Pleasant Valley Hotel	Taylor et al. 1964; Replogle 1956
			48YE773, Marshall-Firehole Hotel	Hunt et al. 1994; Hunt 1993b; Corbin et al. 2003
		Frame lodge/hotel	48YE402, Norris Lunch Station Hotel #1	Ayres1989; Cannon and Phillips 1993a; Sudderth 1993; Stupka-Burda 1995; Hunt 1989; Johnson 1989; Sanders et al. 2003" has been changed "Sanders et al. 2003" as per reference list. Is itOk
			48YE19, Norris Hotel II	Ayres 1989; Cannon and Phillips 1993a; Sudderth 1993; Hunt 1989
			48YE676, Lake Hotel	Site form
		Garbage dump/scatter	48YE158, unidentified tent camp dump	Sanders et al. 1996
			48YE159	Sanders et al. 1996
Park management	Government management	Mammoth HQ structure Superintendent's House Assist. superintendents' cabin Garbage dump/scatter		

Table 1.2 (continued)

Theme	Subtheme	Anticipated site function	Recorded sites*	Reference
	Military management	Mammoth HQ structure	48YE443, Fort Yellowstone (est. 1891)	Taylor et al. 1964
		Soldiers' outpost/cabin (former Asst. Supt. cabin)	48YE88, Soda Butte Ranger Station	Karsmizki 1998; Sanders et al. 1996
			48YE727, Fountain Soldiers Station	Hartley et al. 1993; Hunt 1993b, 1995; Karsmizki et al. 2001
		Soldiers tent camp		
		Patrol ("snowshoe") cabin		
		Garbage dump/scatter		
	Prohibited activities	Poachers cabin		
		Poacher encampment		
		Butchering station		
		Mining cabin and structures	24YE60, cabin and sluices	Site form
		Garbage dump/scatter		

Fig. 1.5 Tourists in the Upper Geyser Basin, Yellowstone National Park, circa 1910 (NPS Photo by J.P. Clum Lantern)

The "sagebrusher" was a traveler or group of travelers who chose to tour the park on their own. The common feature of such travelers was the eschewing of lodging in concessionaires' accommodations and camping at random locations or in camp grounds established at various times in the park. Camping in the sagebrush at lower elevations is likely the source of their name. It is probable that sagebrushers were mostly working and middle class people living in the immediate region. The relatively elaborate services of the established hotel and transportation companies may have been either beyond the means of the sagebrusher or simply not desired by such visitors. As such, these travelers were of little economic importance to those engaged in park concessions giving rise to the term "sagebrusher" as a label of contempt on the part of hotel and stageline employees.

The second category of autonomous tourist was travelers contracting with individuals or "independents" rather than lodging companies. As was the case for the larger, more formal lodging and transportation companies, these independents formed tourists into "wagon parties." Independents provided a relatively economical form of guided transport which included food, supplies, and camping in the park. Tourists using these services may have been largely cost-minded, middle class travelers who had arrived at the park gates by train.

A class of Yellowstone tourist which had a major impact on the park's services and resources was the "beau monde," those wealthy extra-regional travelers with considerable leisure time. This wealthy class of tourist commonly used the touring, lodging, meal preparation, and other facilities offered by the major park conces-

sionaires. This group was relatively numerous as is demonstrated by the statistics for 1897, where approximately one-half of all tourists to the park were of this class. Their relatively large numbers, their financial resources, and their expectation of receiving only the best of everything placed these tourists in a position to exert the greatest economic force in Yellowstone's touring trade. As such, the group had the greatest influence for development in the park.

External Facilitators

External Transportation

The capacity for moving the touring public to Yellowstone National Park continued to improve throughout this period. Perhaps of greatest importance was the extension of rail heads to the very gates of the park. The Northern Pacific Railroad extended its terminus from Cinnabar to Gardiner in 1902–1903 (Fig. 1.6), and the Union Pacific connected to the west entrance at Riverside/West Yellowstone in 1907 (Yellowstone National Park Archivist Lee Whittlesey March 10, 1994, personal communication). In addition, the Utah and Northern narrow gauge railroad brought its services to Beaver Canyon or Monida (pre-1908) at which point tourists could take a stage to the park. External transportation was further enhanced as additional roads and bridges were built, improved, and maintained under various government authorities rather than through private construction.

Fig. 1.6 A passenger train of the Northern Pacific Railroad arrives at Gardiner, circa 1905 (NPS Photo, photographer unknown)

Conveyances

Conveyances were similar to those of the previous period in their variety although expansion of the railroads was such that this became the primary means of bringing tourists to park. Stage coach service was also available as a means of visiting the park. Finally, personal or rented horse-drawn wagons and buggies or horses continued to be rented and used by the more adventurous or by vacationers living in the region.

External Support and Supply

Both local and regional supply sources continued to develop throughout Period III. The railroad provided transport supplying most of the park and region's consumer needs bringing goods from sources on both coasts. The growth of Cinnabar, Gardiner, and West Yellowstone at primary park entrances probably had major roles in supplying the short-term needs of the tourist before and after visiting the park as well as in the resupply of village residents, local ranchers, park management, and concessions companies.

Internal Facilitators

Internal Transportation

Inside the park, the primary transportation networks were realigned and improved with park road construction and maintenance provided under the auspices of the US Army Corps of Engineers. This resulted in the completion of the Grand Loop (Belt Line) Road during the first half of the period. The importance of this accomplishment is denoted by the fact that this road is essentially the same as the present primary transportation route inside the park.

Inside the park, tourists had a number of conveyance options depending upon their finances and the means used to get to the park in the first place. Horse-drawn wagons and buggies, horses, or pack trains were available for rent from "independents" (Fig. 1.7). These could often be acquired with an accompanying driver who also served as guide and interpreter. The most important intra-park transportation however, was the stage. It was during this period that the system of tourist stagelines was perfected. These were either organized under a hotel company's transportation privileges or established as an independent company allied with a lodging company. Tour guides were an integral part of this arrangement, with the stage or wagon driver usually serving in that capacity.

Internal Support and Supply

Lodging and food services were upgraded and diversified during Period III to meet the demands of a significantly larger and broader-based touring public. It was during this period that the internal support and supply of the touring public became assured and steady. Accommodations were provided for a wide range of traveling budgets

Fig. 1.7 "Independent" tourists traveling on their own through the park around the turn-of-the-20th century (NPS Photo, photographer unknown)

and individual expectations. Commercial lodging varied from tents to crude frame structures to luxury hotels. The kinds of meals available were similarly varied, ranging from simple to elaborate.

The beginning of Period III witnessed a considerable expansion in the number and variety of commercial organizations engaged in the tourist trade. These included facilities for supplying food, lodging, transport, and a variety of other services. As was the case for the previous period, large organized companies tended to dominate the tourist business. Nevertheless, a few independent individuals continued to operate during at least the early portions of this period. There was a strong tendency throughout the period toward consolidation of corporate entities engaged in providing elite tourist services. Although little is known about the corporate structures of the companies providing lower and middle tier tourist services, there appears to have been a general trend toward diversification and independent ownership of such companies throughout Period III.

The internal support facilities followed the new and improved road system with lodging and meals provided at all major focal points and along routes in between. At the primitive end of the range were personal camping or perhaps a fishing expedition while staying at the rustic Yancey's Pleasant Valley Hotel owned and run by "Uncle" John Yancey from 1884–1906. Intermediate establishments were also available for those not so faint of heart. These took the form of frame structures and tent camps raised at major tourist focal points and along routes to major focal points. At the top end of the scale were the elite hotels. Period III represents the high point of the elite tourist trade and the economic impact of the relatively large numbers of upper class or wealthy tourists coming to Yellowstone allowed these elite establishments to be greatly expanded in number and size. Like their lesser, more rustic counterparts, these elite facilities could now be found at all major tourist points in the park.

Park Management

The park continued to operate under military management throughout Period III. Accomplishments of the Army managers during this era were several. Among these was the completion of Grand Loop Road construction as well as the construction and expansion of a major military post, Fort Yellowstone. Expansion of Fort Yellowstone continued through 1913.

Enhanced protection of park resources was effectuated by moving soldiers into the park at various encampments along the major tour routes. Among these were a number of tent camps and soldier outposts/cabins or "stations" (Fig. 1.8). The

Fig. 1.8 Soldiers stations, such as this one at Tower Falls, were established throughout the park to protect the park's attractions in the summer and resist poachers in the winter (NPS Photo, photographer unknown)

latter were expanded in number and formalized with semi-permanent structures through 1912 (see Haines 1977b:184–188). Protection of animals from poachers in the winter was accomplished through the establishment of additional winter patrol ("snowshoe") cabins. These were expanded in number from six to nineteen (see Haines 1977b:194). Finally, park managers concentrated much of their energy and funds toward the enhancement of Yellowstone's wildlife resources. The US Fish and Wildlife Service provided this service through the institution of fish traps, fish seeding stations, and hatcheries at various lakes and streams throughout the park. Both this agency and the Army provided protection for breeding herds of elk and bison and significantly increased the size of those herds through construction and operation of game farms and ranches.

Termination of Period III

Period III concluded with revolutionary changes in the structure of Yellowstone Park tourism. Among these were reestablishment of civilian park management, further consolidation of the major tourist-based companies, the opening of the park to automobiles, and a virtual transformation of the tourist industry in and around the park.

Identified and Expected Archeological Resources

With the radical changes in park tourism expressed throughout Period III, the number of historical archeological sites in Yellowstone National Park should increase substantially in number and function once again when compared with those in Periods I and II. As well, one would expect the functional ranges of Period III sites to become broader. A review of the literature suggests the potential range of anticipated site functions has increased to 38 and a preliminary review of the archeological data demonstrates that the number of recorded sites representative of this period has increased as well; 78 in Period III in comparison with only 21 for the previous period (Table 1.3). At least 33 sites in the park reflect the great expansion in the park's internal transportation system during this period with roads, bridges, route construction, and maintenance accounting for the overwhelming proportion of sites in this functional category. Also of interest are the appearance of sites relating to the more diverse character of public transport with three sites associated with tour boats and docking facilities and two sites associated with transportation companies' barns and corrals. Internal support and supply for tourists is expanded once again when compared with the previous period with a greater diversity of accommodations and correspondingly substantial increase in sites recorded ($n = 26$ in Period III compared with 7 for Period II). Sites include tent camps, a range of hotel accommodations, and water supply systems. A similar increase in site frequency is seen for the Park Management theme. Anticipated functional categories have increased to fourteen representing military, conservation, and illegal activities. Sixteen sites

Table 1.3 Yellowstone National Park, Period III (1893–1915): archeology sites associated with tourism

Theme	Subtheme	Anticipated site function	Recorded sites*	Reference
Internal transportation	Route	Trail		
		Road	48YE16, Mammoth-Clarksfork Road	Johnson 1989
			48YE520, Grand Loop Road	Culpin 1994; Sanders 1996; Sanders et al. 1996; Sanders and Wedel 1997
			48YE821, Cooke City Miner's Road	Sanders et al. 1996a
			48YE774, Fountain Freight Road	Hartley et al. 1993
			48YE789, Firehole Lake Road	Hartley et al. 1993
			48YE786, Corduroy Road	Hartley et al. 1993
			48YE826, Chittenden Road, Tower to Canyon Junctions	Sanders et al. 1996b
		Bridges, culverts, etc.	48YE734, Corkscrew Bridge	Cannon and Phillips 1993b
	Road construction and maintenance	Road camp and outbuilding	48YE21, Dunraven Pass site	Ayres 1989; Cannon 1990; Hunt 1989; Culpin 1994; Sudderth 1993
			48YE105, Mount Washburn road camp (tent)	Sanders et al. 1996b
		Garbage dump/scatter		
		Water tank site	48YE225	Culpin 1994; Sanders and Wedel 1997
		Quarry	48YE104, gravel pit	Sanders et al. 1996b
			48YE179, gravel pit	Sanders et al. 1996b

Table 1.3 (continued)

Theme	Subtheme	Anticipated site function	Recorded sites*	Reference
			48YE120, gravel pit	Sanders et al. 1996d
			48YE121, gravel pit	Sanders et al. 1996d
			48YE178, gravel pit	Sanders et al. 1996b
			48YE95, gravel pit	Sanders et al. 1996a
			48YE99, gravel pit	Sanders et al. 1996a
			48YE100, gravel pit	Sanders et al. 1996a
			48YE166, gravel pit	Sanders et al. 1996a
			48YE167, gravel pit	Sanders et al. 1996a
			48YE168, gravel pit	Sanders et al. 1996a
			48YE509, gravel pit	Sanders et al. 1996c
			48YE125, gravel pit	Sanders et al.1996d
			48YE130, gravel pit	Sanders et al. 1996d
			48YE169, gravel pit	Sanders et al. 1996a
			48YE171, gravel pit	Sanders et al. 1996a
	Conveyance	Boat	48YE13, E.C. Waters	Johnson 1989; Bradford et al. 2003
		Boat dock	West Thumb dock cribs	Bradford et al. 2003
			48YE247, Lake Boat Docks	Bradford et al. 2003
		Stage station		
		Barns/corral	48YE1494, Mammoth Bus/Barn Transportation Complex	Sanders and Wedel 2004
			48YE155, YNP Transportation Co.	Sanders et al. 2001
		Garbage dump/scatter		
Tourist	NA	Informal camp site	48YE1360	Sanders and Clayton 2003
		Entertainment		
		Garbage dump/scatter	48YE130, picnic scatter	Sanders et al. 1996d

Table 1.3 (continued)

Theme	Subtheme	Anticipated site function	Recorded sites*	Reference
Support and supply	Accommodations	Tent camps	48YE681, Roosevelt Lodge Historic District (Wylie Camp)	Johnson n.d.
			48YE483, Wylie Swan Lake Camp	Cannon and Phillips 1993a; Sanders et al. 1996
			48YE158, Wylie Canyon Camp II	Sanders et al. 2003
		Log hotel	48YE428, Yancey's Stage Stop	Taylor et al. 1964; Replogle 1956
		Frame lodge/hotel	48YE19, Norris Hotel II	Ayres 1989; Cannon and Phillips 1993a; Hunt 1989
			48YE517, Old Faithful Inn	Site form
			48YE676, Lake Hotel	Site form
			48YE786, Fountain Hotel	Hartley et al. 1993
			48YE682, Old Faithful Historic District	Johnson n.d.
			48YE517, Old Faithful Inn	National Register documentation
		Utilities	48YE1007, Canyon Hotel spring boxes	Sanders and Wedel 2000
			48YE874, Canyon Hotel water supply system	Christopher 1995; Sanders and Wedel 2000
			48YE754, Glen Creek to Mammoth Water Supply System – storage reservoir	Sanders 2003a

Table 1.3 (continued)

Theme	Subtheme	Anticipated site function	Recorded sites*	Reference
			48YE1351, Gardner to Mammoth Water Supply System	Sanders 2003b
			48YE177, Antelope Cr. to Tower water line	Sanders et al. 1996b
			48YE218, Glen Creek to Mammoth Water Supply System – head gate	Olliff 1996
		Garbage dump/scatter	48YE18, Canyon Village Dump	Ayres 1989; Hunt 1989
			48YE20, Canyon Hotel Dump	Ayres 1989; Hunt 1989
			48YE24, Swan Lake Flats Dump	Cannon and Phillips 1993a
			48YE32, Roosevelt Lodge Dump	Cannon and Phillips 1993a; Sudderth 1993
			48YE33, Roosevelt I Scatter	Cannon and Phillips 1993a; Sudderth 1993
			48YE38, Elephant Back I (Lake Hotel) Dump	Cannon and Phillips 1993c; Sanders and Wedel 1997; Sudderth 1993a
			48YE161	Sanders et al. 1996
			48YE26, Wylie Canyon Camp II Dump	Ayres 1989; Sanders et al. 2003
			48YE483, Cottrell (Swan Lake Wylie Camp)	Cannon and Phillips 1993a
			48YE726, Norris Hot Pots Dump	Cannon and Phillips 1993a

Table 1.3 (continued)

Theme	Subtheme	Anticipated site function	Recorded sites*	Reference
			48YE59, Old Faithful Dump	Cannon 1995
			48YE722, Mammoth Dump (YPA)	Cannon and Phillips 1993a
			48YE744, Lake Hotel dump	Cannon and Phillips 1993a; Cannon 1995
	Stores	Buildings and outbuildings		
		Garbage dump/scatter		
Park management	Management (Military)	Mammoth HQ structure	48YE443, Fort Yellowstone	Taylor et al. 1964
		Soldiers station	48YE88, Soda Butte Soldier Station	Sanders et al. 1996a; Karsmizki 1998
			48YE163, Tower Falls Solder Station	Sanders et al. 1996b; Karsmizki 2000; Sanders et al. 2003
			48YE727, Fountain Soldiers Station	Hartley et al. 1993; Hunt 1995; Karsmizki et al. 2001
		Patrol ("snowshoe") cabin	48YE933, Fern Lake Snowshoe Cabin	
			24YE44, B-J Divide Lake cabin	Site form
		Garbage dump/scatter	48YE1503, Bechler River Ranger Station Dump	
			48YE722, Mammoth Dump	Cannon and Phillips 1993a
	Prohibited activities	Poachers cabin, camp, and other structures	48YE7, Poacher's Cabin site (Blacktail Deer Cr.)	Wheaton 1989
			24YE45, B-J Divide Lake hunter's log cabin	Site form
			24YE61, trapper's cabin	Site form

Table 1.3 (continued)

Theme	Subtheme	Anticipated site function	Recorded sites*	Reference
			24YE53, hunting blind	Site form
			24YE62, cabin	Site form
			24YE63, cabin	Site form
		Butchering station		
		Mining	24YE368, McMinn (coal) Mine	Site form
		Garbage dump/scatter		
	Fish and game management	Fish hatchery		
		Fish spawn management/egg collection station		
		Elk corral		
		Bison ranch	48YE680, Lamar Buffalo Ranch	Johnson n.d.; Sanders et al. 1996a
		Garbage dump/scatter		
	Other	Logging camp?	48YE30, Logger's Cabin	Cannon and Phillips 1993a; Sudderth 1993

are associated with this theme in comparison with only three for the previous period although, again, the literature suggests many more with this theme should occur within the park. More focused archeological research is required to locate the quantities and varieties of sites to allow comparisons with those of disparate function within previous periods as well as comparisons with sites of similar function from Periods IV.

Period IV – Transition and Reformation (1916–1942)

Defining Characteristics

Characteristics of Period IV include revolutionary changes in the park's structure and infrastructure which led to visitation by a broad spectrum of the population. The two basic changes which quickly and radically altered the park were the opening of the park to automobiles in 1915 and the establishment of the National Park Service in 1916. These two actions returned park management to civilian control; consolidated and reduced the number of concessions operators in the park; altered the number, locations, and types of facilities needed to support the tourist trade; and effected an overall "democratization" of the tourist trade.

The Tourists

After World War I, the American tourist elite changed its focus of travel from Europe to the United States (Graburn 1989:30–31; Culpin 1994:114). This tremendous increase in the "fashionableness" of travel to American tourist spots was carried through to all other elements of the touring public, a factor which is reflected in the enormous increase in Yellowstone tourist traffic volume throughout Period IV. During this time, the number of tourists visiting the park grew from about 36,000 to about 580,000 per year. This change in tourist traffic was not simply a matter of numbers but one of composition as well. The introduction of the automobile had a democratic effect, allowing large numbers of the working and middle class access to the park. These automobile tourers were essentially independent car camping travelers and represented the motorized equivalent of the sagebrushers of Periods I–III.

Many of the tourists traveling by automobile to and through Yellowstone during Period IV were people who resided near the park. However, for the first time, a considerable number (if not most) of these tourists lived a considerable distance away from the park. Automobile tourists may be generally categorized into two groups. The first, having the least economic impact upon the tourist businesses of the park and region, were the "car campers." These tourists traveled to the park on their own and self-guided touring was the *modus operandi* as they traveled through the park. Virtually all meals were self-prepared and lodging was in special autocamps built by the National Park Service (Fig. 1.9). It is likely that the preponderance of car campers were cost-minded, working, and middle class families. Car campers

Fig. 1.9 Tourists residing at a National Park Service automobile camp in the 1930s (NPS Photo, photographer unknown)

also composed the substantial portion of those coming to the park by automobile. For example, in 1923, two-thirds of those coming to the park by auto brought their own camping gear (Culpin 1994:114).

The second type of self-guided traveler was the "auto tourer." Such visitors differed from the car camper by utilizing at least some of the services provided by park hotels, restaurants, etc. They could therefore be expected to have a somewhat greater impact on the form and diversity of services provided by concessionaires. They may also have made up a somewhat different social class than the car campers, perhaps largely composed of middle to upper class strata of society.

The impact of the automobile tourists upon the park was tremendous as can be shown by the visitor statistics for 2 years. In 1920, approximately 50,000 or 62% of the total 80,000 visitors coming to Yellowstone Park toured by 13,502 private autos. By 1928, 183,565 or almost 80% of the 230,984 visitors to park, toured by auto.

In contrast, group tours sponsored by trains and park hotels decreased in importance throughout the period. However, it is likely that this group continued to have an influence which was much larger than that of tourists traveling by automobile due to their greater economic impact on the park. Group tourists were probably of middle to wealthy classes and virtually always extra-regional travelers.

External Facilitators

External Transportation

Although three major railroad companies continued to bring tourists to the park, this form of transport accounted for an increasingly smaller proportion of park visitors. Railroads were therefore of much less significance than during the preceding period.

Roads and highways outside the park, on the other hand, continued to be expanded and upgraded. Building and maintaining roads suitable for automobile traffic were economically well beyond the means of private construction leaving this as an almost exclusive activity of governmental agencies (primarily state and federal). Major arterials leading to the park were realigned, widened and otherwise upgraded, and maintained for automobile traffic at ever increasing speeds. For much of the period, highways outside the park were technologically superior to those inside creating a potential for bringing more tourists to the park than its roads were able to handle safely.

As indicated by the above, conveyances bringing the public to and through the park were expanded. Outside the park, the railroads continued to bring large numbers of tourists. The Northern Pacific Railroad connected to the Gardiner terminus brought the bulk of the "beau monde" travelers. The Union Pacific Railroad similarly brought visitors directly to the park via its west entrance at West Yellowstone. The Burlington Railroad terminal at Cody connected with the park via stage or motorcoach bringing similar groups of visitors through the park's east entrance.

Persons in the Yellowstone region still came to the park on horseback or using their own horse-drawn wagons and buggies during initial years of this period. Such conveyances could be rented outside the park as well, but from 1916 forward, travel to and within the park was increasingly dominated by the automobile.

External Support and Supply

It is not known to what extent external sources of support and supply changed or endured from the previous period. It is likely, however, that expansion of existing resources of support and supply for Yellowstone National Park during Period IV continued through the 1920s as the nation experienced rapid economic growth and nearby towns of Livingston, Bozeman, Virginia City, Gardiner, and West Yellowstone expanded. The impact of the Depression of the 1930s remains uncertain.

Internal Facilitators

Internal Transportation

Yellowstone National Park's roads were opened to automobiles at the beginning of this period, an action which led to a number of fundamental changes in the park both

physically and in the manner of its operation. Soon after taking control of Yellowstone, the park's civilian management mandated that all tour vehicles be powered by gasoline. This occurred within one year of the decision and effected the sudden and complete removal of the vast infrastructural support required for horse-drawn conveyances. This also brought about the loss of hundreds of jobs associated with the maintenance of horses and horse-drawn conveyances as well as the removal of thousands of horses from pasturing in the park's meadows. Increased speed of vehicular traffic required the wholesale upgrading of roads and bridges. This construction was initiated immediately after World War I but was not completed until the late 1930s.

Although independent means of transportation increasingly predominated tourist travel inside the park, the transportation system developed in the earlier periods by the hotel and camping companies continued to play a strong role. The system of stagelines immediately switched from horse-drawn conveyances to motorcoach carriers after National Park Service management was in place. The management also mandated consolidation of all carriers resulting in the creation of a single in-park transportation business, the Yellowstone Park Transportation Co. (Fig. 1.10).

Fig. 1.10 Touring the Upper Geyser Basin and Old Faithful Geyser via a Yellowstone Park Transportation Co. bus (postcard by Jack E. Haynes in the author's collection)

Internal Support and Supply

Automobile travel inside the park brought about a complete reformulation of the tourist support facilities within a few years. This factor was reflected in a drastic reduction in the number and locations of facilities oriented toward the "beau monde"

and the introduction and expansion of new types of facilities for the tourist of more modest means.

As with the previous period, support and supply of the tourist as well as tourist and management facilities was assured and steady. Tourists who chose to camp in the park-established campgrounds had relatively easy access to supplies from a variety of sources located both inside and immediately outside of the park. Whatever their character, however, all such resources were ultimately derived from outside the park. One would expect, given the extremely diverse composition of the tourist population visiting Yellowstone, that the goods and supplies at each tourist facility would be similarly diverse (and perhaps distinguishable archeologically).

The range of accommodations supplied to the tourist in the park was significantly broader than that of previous periods. For the first time, park management was directly involved in lodging with park construction and operation of a number of autocamps. These provided very minimal services (a camp site and fire ring with access to an outhouse and well) for little or no charge to the visitor. In addition, concessions companies continued to offer an extremely diversified choice of accommodations which were directed at a broader range of Yellowstone's travelers. These included (from most minimal to most luxurious) tent camps, house-keeping cabins of several accommodation grades, medium class lodges, and luxury hotels. At the lower end of the accommodation scale, the tourist could provide for their own meal. In some cases, such as in the cabins, small kitchens were a part of the accommodation. However, meals could also be provided by the concessionaires at all areas where overnight accommodation could be had as well as in some areas between these locations. Meals varied from simple to elaborate and from modest to expensive in keeping with the expectations of the tourist at each facility.

From 1917 through 1936, park concessions by five interrelated "Yellowstone Park" companies provided food, lodging, fuel (campfire wood), boating facilities, and land transport. These services (other than fuel) were largely directed toward the middle and upper class tourist trade and businesses were dominated by corporations rather than by individual ownership. After 1936, all five corporations were required to combine and this was quickly accomplished with the formation of the Yellowstone Park Company. Lower- and middle-tier tourist services were supplied by the National Park Service and independently owned stores of various kinds.

Park Management

The creation of the National Park Service in 1916 returned park management to civilian control. However, the military presence did not finally end until 1918 (Haines 1977b:208; Culpin 1994:86). This new management radically altered the manner in which the park was run. Considering unchecked competition of concessionaires to be harmful to the park system, Washington encouraged the monopolistic approach to the best business alternative. Yellowstone management therefore mandated the consolidation of the various companies operating in park into only five non-competing entities, each supplying a different service to the tourist. Ownership of these entities was restricted to a few individuals. In 1936, consolidation of these

five companies was mandated and the Yellowstone Park Company was born. Only the small stores were left out of this consolidation process.

After the creation of the National Park Service in 1916, the park's civilian managers recognized that substantial changes were taking place in the touring public. The National Park Service therefore entered the field of supplying tourist support for the first time by building and operating an extensive network of automobile camps and museums.

Another management action taken by the National Park Service for the duration of Period IV was the upgrading of roads throughout the park to accommodate automobile traffic. Initial attempts were made to do this wholly within the Service itself. Recognition of the superiority of highways constructed outside the park, and the Service's weakness in road construction technology quickly led to a partnership with the Federal Highway Authority for the purpose of constructing roads of equal quality inside the park.

Protection and management of park resources under civilian authority was continued by hiring former Fort Yellowstone soldiers as park rangers (Fig. 1.11) and through adopting methods developed by former Army managers. The new managers continued utilization of soldiers outposts/cabins ("stations") in the summer, renaming them "ranger stations." The old military patrol ("snowshoe") cabins also continued to be used during winter patrols. The Fish and Wildlife Service also aided National Park Service managers in their mandate to protect the wildlife and

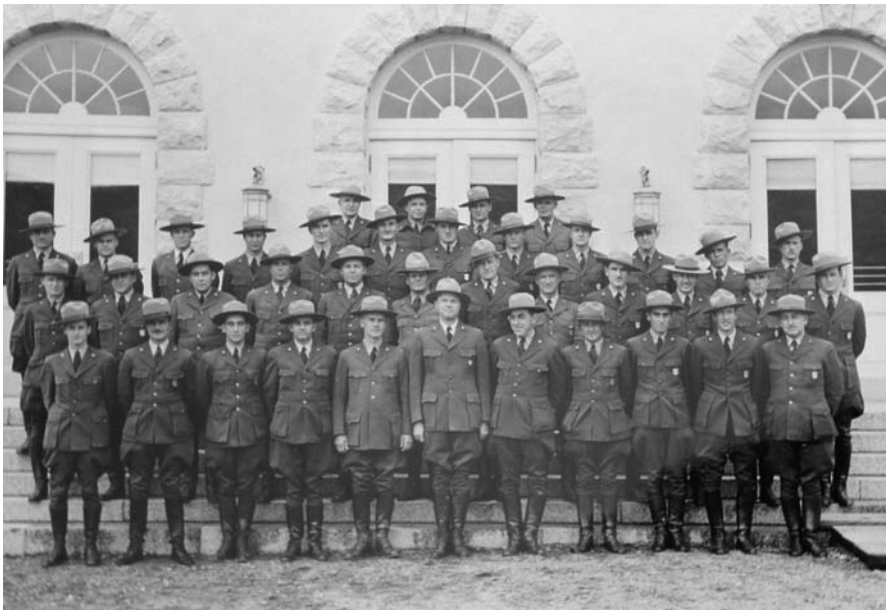

Fig. 1.11 National Park Service Rangers at Yellowstone, circa 1937 (NPS Photo, photographer unknown)

environment with the establishment and expansion of fish farms and game ranches. Wildlife management was further enhanced by creation of a natural science research branch within the park's management hierarchy.

Termination of Period IV

Period IV terminated with the advent of World War II, an event which brought park tourism to a complete halt between 1942 and 1945. Post-war changes radically altered the structures and philosophy of park operation once again.

Identified and Expected Archeological Resources

With a shift in transport from largely horse-powered vehicles to internal combustion engine vehicles, the archeological reflection of tourism changes once more. As per the previous period, the number of historical archeological sites recorded in Period IV, substantially in number and function and functional range sites becomes somewhat broader (Table 1.4). A review of the literature suggests the potential range of anticipated site functions has increased to 43. The number of sites associated with the Internal Transportation theme decreases to 24 during this period. Whether this is due to the change in mode of transportation or whether, for some reason, fewer of these sites actually occur, is not determinable at this point. Roads, bridges, route construction, and maintenance continue to account for the overwhelming proportion of sites in this functional category. For the first time, however, there are well-documented road construction camps and, given the changes in transport, there should be gasoline stations which have not been recorded to date. Tour boats and docking facilities continue to be used through most of this period. Tourist theme sites, for the first time, are represented by an informal campsite. Support and Supply sites demonstrate a much greater diversity reflecting the greater diversity of the touring public. Sites associated with this theme are as numerous as those recorded for interior transportation ($n = 24$) with a diversity similar to that shown by the previous period, although with the addition of National Park Service automobile camps and picnic grounds as well as tourist stores. A similar increase in site frequency is seen for the Park Management theme which has 21 sites associated with it. These sites are entirely civilian in comparison to the previous era whose management sites were entirely military.

Potential Research Topics and Data Requirements

In previous anthropological studies of tourism, information sources have included a diverse array of data sources. Among these are primary documents, objects, published materials, interviews, and personal observation. To this, the discipline of historical archeology adds data retrieved from archeological sites allowing examination of patterns of similarity and dissimilarity within and between site types as well

Table 1.4 Yellowstone National Park, Period IV (1916–1942): archeology sites associated with tourism

Theme	Subtheme	Anticipated site function	Recorded sites*	Reference
Internal transportation	Route	Trail		
		Road	48YE823, South Entrance Road segment	Sanders 2002
			48YE520, Grand Loop Road	Culpin 1994; Sanders 1996; Sanders et al. 1996d; Sanders and Wedel 1997
			48YE1567, Moran to Yellowstone Approach Road	Sanders 2002
			48YE821, Northeast Entrance Road	Sanders et al. 1996a
		Bridges, culverts, etc.	48YE675, Fishing Bridge II	National Register nomination
			48YE814, Cub Creek Bridge	
			48YE818, Lamar River Bridge	Culpin 1994
	Road construction and maintenance	Camp and outbuilding	48YE21, Dunraven Pass site	Ayres 1989; Culpin 1994; Cannon and Phillips 1993a
			48YE792, Goose Lake Road Camp (Morrison Knudson Co. road crew camp)	Hartley et al. 1993
			48YE44, Middle Creek I (Morrison Knudson Co. road crew camp)	Cannon and Phillips 1993b; Sanders and Wedel 2003b

Table 1.4 (continued)

Theme	Subtheme	Anticipated site function	Recorded sites*	Reference
			48YE1009, construction camp	Sanders and Wedel 2000
			48YE109, construction camp	Sanders et al. 1996b
		Water tank site	48YE23, Government Corral site	Ayres 1989
			48YE123	Sanders et al. 1996d
		Quarry	48YE164, gravel pit and dump	Sanders et al. 1996a
			48YE125, gravel pit	Sanders et al. 1996d
		Garbage dump/scatter	48YE768, Nez Perce CCC camp dump	Hartley et al. 1993
			48YE45, Middle Creek II	Cannon and Phillips 1993b
	Conveyance	Boat	Lake Hotel launches	Bradford et al. 2003
			48YE13, E.C. Waters wreck	Johnson 1989; Bradford et al. 2003
		Boat dock	West Thumb dock cribs	Bradford et al. 2003
			48YE247, Lake Boat Docks	Bradford et al. 2003
		Stage/bus station barns, corrals, garages	48YE1494, Mammoth Bus/Barn Transportation Complex	Sanders and Wedel 2004
			24YE124, Yellowstone Park Transportation Co. Historic District	Site form
			48YE155, YP Transportation Co. – Canyon Transportation Complex	Sanders et al. 2001
		Filling stations		

Table 1.4 (continued)

Theme	Subtheme	Anticipated site function	Recorded sites*	Reference
		Garbage dump/scatter		
Tourist		Informal camp site	48YE47	Sanders and Wedel 2003b
		Garbage dump/scatter		
Support and supply	Accommodations	Tent camp	48YE637, Canyon Lodge (Shaw and Powell Co. camp)	Sanders and Wedel 2000
		Housekeeping cabins	47YE1372, Canyon Housekeeping Cabins	Sanders et al. 2003
		Lodge, hotel, hotel outbuilding	48YE681, Roosevelt Lodge Hist. District	Johnson n.d.
			48YE743, Roosevelt Corral	Cannon and Phillips 1993a
			48YE749, Roosevelt Dynamite Bunker	Cannon and Phillips 1993a
			48YE637, Canyon Lodge	Sanders and Wedel 2000
			48YE517, Old Faithful Inn	National Register doc.
			48YE682, Old Faithful Historic District	Johnson n.d.; National Register Nomination 2003
			48YE676, Lake Hotel	Site forms
		Employee housing	48YE519, Canyon Village Dorms	Site forms
		Utilities	48YE1007, Canyon Hotel spring boxes	Sanders and Wedel 2000
			48YE874, Canyon Hotel water supply system	Christopher 1995; Sanders and Wedel 2000
			48YE102, dam and water pipeline for Tower Falls	Sanders et al. 1996b

Table 1.4 (continued)

Theme	Subtheme	Anticipated site function	Recorded sites*	Reference
			48YE754, Glen Creek to Mammoth Water Supply System – storage reservoir	Sanders 2003a
			48YE1351, Gardner to Mammoth Water Supply System	Sanders 2003b
			48YE111, dam and access road	Sanders et al. 1996b
			48YE218, Glen Creek to Mammoth Water Supply System – head gate	Olliff 1996
		Garbage dump/scatter	48YE18, Canyon Village Dump	Ayres 1989; Hunt 1989
			48YE20, Canyon Hotel Dump	Ayres 1989
			48YE32, Roosevelt Lodge Dump	Cannon 1990
			48YE33, Roosevelt I Scatter	Cannon 1990
			48YE37, Elephant Back I (Lake Hotel) Dump	Cannon and Phillips 1993a; Sudderth 1993
			48YE38, Elephant Back II (Lake Hotel) Dump	Cannon and Phillips 1993a; Sanders and Wedel 1997; Sudderth 1993
	NPS accommodation	Automobile camp	48YE158, Canyon Public Autocamp/Shelter	Sanders et al. 2003

Table 1.4 (continued)

Theme	Subtheme	Anticipated site function	Recorded sites*	Reference
		Picnic area	48YE46	Cannon and Phillips 1993a; Sanders and Wedel 2003b
	Lunch station	Building/outbuilding		
		Garbage dump/scatter		
	Store	Building/outbuilding	48YE1371, Whittaker/Pryor-Trischman Store	Sanders et al. 2003
			48YE1373, Haynes Photo Studio/Store	Sanders et al. 2003
		Garbage dump/scatter		
Park Management	Civilian Park Management	Mammoth HQ structure	48YE443, Old Fort Yellowstone	Taylor et al. 1964
			48YE486, Fort Yellowstone	Site form cited
		Rangers' station	48YE88, Soda Butte Ranger Station	Karsmizki 1998
			48YE1370, Old Canyon Ranger Station	Sanders et al. 2003
			48YE727, Fountain Soldiers Station	Hartley et al. 1993; Hunt 1995; Karsmizki et al. 2001
		Patrol ("snowshoe") cabin	48YE933, Fern Lake Snowshoe Cabin	
			48YE934, Fox Creek Snowshoe Cabin	
		Garbage dump, scatter, incinerator	48YE36, Washburn Peak Dump Site	Sudderth 1993

Table 1.4 (continued)

Theme	Subtheme	Anticipated site function	Recorded sites*	Reference
			48YE164, Tower Falls Soldier Station Dump	
			48YE1502, Bechler River Ranger Station Dump	
			48YE1503, Bechler River Ranger Station Dump	
			48YE23, Canyon Incinerator	Ayres 1989; Sanders et al. 2001
	Interpretation	Museum	48YE684, Madison Museum	Johnson n.d.; National Register Nomination 2003
			48YE686, Fishing Bridge Museum	National Register Nomination 2003
			48YE230, Norris Geyser Basin Museum/Comfort Station	Site form
		Kiosk	48YE683, Obsidian Cliff Kiosk	Johnson n.d.; National Register Nomination 2003
		Bear feeding station	48YE927, Otter Creek Bear-Feeding Station	Sanders 2000
	Civilian Conservation Corps (CCC)	Camp		
		Garbage dump	48YE768, Nez Perce Camp YN5 Dump	Hunt et al. 1994
	Fish and game management	Fish hatchery	48YE1416, Lake Fish Hatchery	Site form
		Fish spawn management		
		Elk corral		

Table 1.4 (continued)

Theme	Subtheme	Anticipated site function	Recorded sites*	Reference
		Water supply/hay field irrigation	24YE19, Reese Cr. Ditch	Site form
			24YE18, spring box, reservoir, pipeline	Site form
		Bison ranch	48YE680, Lamar Buffalo Ranch	Johnson n.d.; Sanders et al. 1996a
	Prohibited activities	Logging camp? Poachers cabin Poacher encampment Butchering station Garbage dump/scatter	48YE25, Lewis River site	Ayres 1989

as within and between temporal periods. The historical archeologist pursuing a study of tourism at Yellowstone National Park (and many other tourist sites) has access to and is able to draw from an extremely broad range of data sources, selecting those which most adequately address the issue of interest. While the research potential for this type of study is almost unlimited, a few of the more obvious research themes are addressed in the following pages which may be applied to Yellowstone in particular and other tourist sites in general. While potential research questions are broadly defined and the most probable data sources identified in each case, it is of course up to the individual historical archeologist to determine which, if any, of these topics are pursued and the manner in which that research is formulated and executed.

The Cultural Landscape

One of the topics which could be approached through historical archeology is the identification and definition of the cultural landscape – a kind of "settlement system" approach to the subject. Topics for research and data sets to address the topics are presented in Table 1.5. Note that data required to address these issues is derived from both documentary and archeological sources.

Table 1.5 Research questions and potential data sources related to the topic of cultural landscapes in Yellowstone National Park

Research question	Archival data sources	Archeological data sources
1. Where are the historic sites located?	1a. Maps 1b. Oral histories 1c. Government planning documents 1d. Photographs	1a. Site surveys
2. What are the physical components of the site and how are they distributed across the landscape?	2a. Maps 2b. Architectural drawings 2c. Oral histories 2d. Government planning documents 2e. Photographs	2a. Mapping distributions of foundations and other site features
3. What subtheme of the historic tourist context is the site related to?	3a. Maps 3b. Oral histories 3c. Government planning documents 3d. Photographs	3a. Comparison of site features and contents with others of known function
4. What are the intrasite functional relationships of the various site components?	4a. Oral histories 4b. Inventories 4c. Maps 4d. Photographs	4a. Site surveys 4b. Subsurface excavations 4c. Comparisons of assemblages from various portions of the site
5. How have the various site elements been affected	5a. Natural resource literature	5a. Identification of natural resources

Table 1.5 (continued)

Research question	Archival data sources	Archeological data sources
by the natural environment?	5b. Physiographic maps 5c. Maps of environmental zones 5d. Construction planning documents	5b. Mapping distribution of foundations and other site features 5c. Identification of building materials
6. What are the site types and how are these similar sites distinguished from one another?	6a. Comparisons of data from temporally similar sites	6a. Comparisons of data from temporally similar sites
7. What are the intersite relationships between sites of disparate and similar type?	7a. Comparisons of data from sites of the same era	7a. Comparisons of data from sites of the same era
8. How have variations in tourist demography reflected in site location, plan, and deposits?	8a. Government documents 8b. Tourist business documents 8c. Architectural drawings 8d. Contemporary photographs	8a. Comparisons of data from sites of similar and diverse eras
9. How have these various elements changed over time?	9a. Comparisons of data from sites of consecutive temporal eras	9a. Comparisons of data from sites of consecutive temporal eras
10. How are sites at Yellowstone similar or different from contemporary sites at other locations?	10a. Comparisons of data from sites from other resort areas	10a. Comparisons of data from sites from other resort areas

Economics

One of the more obvious and perhaps one of the more interesting approaches to the study of Yellowstone tourism is the study of its economics. In that tourism usually represents a relatively insecure growth industry, research can be directed toward the determination and character of economic fluctuations. Such fluctuations can include such things as obvious seasonal cycling or it may be somewhat more complex. All developed tourist economies go through other types of cycles as well. For example, demand for travel declines during recessions, a major factor for any tourist-based economy. Other factors affecting tourist economies can be such things as the elastic and unstable costs of vacationing, pricing which is generally beyond the control of the destination areas, and the faddish character of tourism – what is popular one moment may not be of interest at another. Tourism also represents conspicuous consumption by the well-to-do and, in many ways, tourism represents an almost colonial interaction between the vacation areas and the region supplying the bulk of the tourists.

Other areas for potential research which have received various degrees of attention by the social sciences are tourist motivation, tourist-local relationships, and socioeconomic repercussions in host area. This last subject has tended to be the cultural anthropologists' focus to date with many looking for and finding the negative impacts that tourism may have on rural populations. A brief list of economic-based questions that may be addressed by historical archeologists working at Yellowstone appears in Table 1.6.

Table 1.6 Research questions and potential data sources related to the topic of economics at Yellowstone National Park

Research question	Archival data sources	Archeological data sources
1. What were the interrelationships between the various tourist businesses?	1a. Journals and other business documents 1b. Oral histories 1c. Government planning documents	N/A?
2. How did these interrelationships change over time?	2a. Journals and other business documents 2b. Oral histories 2c. Government planning documents	N/A?
3. What was the relative access to various types of goods and commodities used by various components of the tourist system (tourists, businesses, concessions employees, park management, families of government employees, etc.)?	3a. Inventories 3b. Orders and bills of lading 3c. Oral histories?	3a. Subsurface excavations 3b. Comparison of goods reflected by bottles, cans, ceramics, and other objects in occupation sites & dumps
4. Who were the suppliers of goods and commodities to the various park entities?	4a. Orders and bills of lading 4b. Inventories	4a. Subsurface excavations 4b. Manufacturers marks on bottles, cans, ceramics, and other objects in occupation sites & dumps
5. What were the supply routes for goods and commodities?	5a. Hotel records 5b. Oral histories 5c. Transportation company records	5a. Subsurface excavations 5b. Manufacturers marks on bottles, cans, ceramics, and other objects in occupation sites and dumps
6. What were the relationships between each facet of the tourist population with various tourist-oriented businesses?	6a. Government records 6b. Hotel and other business records	N/A?

Table 1.6 (continued)

Research question	Archival data sources	Archeological data sources
7. How much did tours of Yellowstone cost?	7a. Hotel pricing lists 7b. Travel brochures	N/A?
8. Are the hotel charges reflected in changes in site plans and artifacts?	8a. Hotel pricing lists 8b. Travel brochures	8a. Site excavations 8b. Analysis of sites' plans and artifact contents
9. What were the changes in these various aspects through time	9a. Various sources listed above	9a. Various sources listed above

The Tourist System

Another important area of study is the evolution of the tourist system. General research topics which might be addressed are listed in Table 1.7. All of the elements listed in that table are important in the determination of a tour's developmental process; i.e., recognize its foundations, early manifestations (these tend to be haphazard, individual, and intermittent although visiting can occur in great numbers), and document its progressive routinization and institutionalization.

Table 1.7 Research questions and potential data sources related to the tourist system at Yellowstone National Park

Research question	Archival data sources	Archeological data sources
1. What were the demographic elements of tourism during each period (status, age, derivation)?	1a. Government records 1b. Hotel records	N/A?
2. What were the physical characteristics of the external tourist routes during each period (route, sites of interest, site types, and overall importance of each to the tour)	2a. Travel guides and brochures 2b. Oral histories 2c. Personal journals 2d. Newspaper accounts 2e. Transportation company records	2a. Site survey for location of sites and roads
3. What were the physical characteristics of the YELL tourist routes during each period (route, sites of interest, site types, and overall importance of each to the tour)	3a. Travel guides 3b. Oral histories 3c. Personal journals 3d. Newspaper accounts 3e. Government records 3 f. Transportation company records	3a. Site survey for location of sites and roads

Table 1.7 (continued)

Research question	Archival data sources	Archeological data sources
4. Were there different kinds of tours and how did these differ from one another?	4a. Travel guides 4b. Oral histories 4c. Personal journals 4d. Newspaper accounts 4e. Government records 4 f. Tourist business records	4a. Determination of site types, locations, etc. as per Table 9.
5. What were the temporal dimensions of the tour (identification of its consecutive phases)?	5a. Travel guides 5b. Oral histories 5c. Personal journals 5d. Newspaper accounts 5e. Government records 5 f. Transportation company records	N/A?
6. What were the superstructures of legends, myths, folklore, and literature associated with the tour?	6a. Oral histories 6b. Personal journals 6c. Newspaper accounts 6d. books and periodicals	N/A
7. Was the tour altered through time? What were the causes (technological, philosophical, outside events, etc.) for the changes and how were they manifested?	7a. All of the above sources 7b. Integration of tour history with local, regional, and national events	7a. All of the above sources and cultural movements

Factors which contribute to the study of tourist systems are the identification of such things as organized versus independent tours, diachronic aspects (changes through the day, week, month, season, and year), rise of marketing/support facilities near major points of interest and along travel routes, and lastly, the establishment of regulations governing site management and mercantile transactions. One may also discover the agencies that were established at distant major population centers have as their goals the promotion, implementation, and organization of travel.

During this process, routes of travel usually become conduits of cultural transmission and this process can be documented as well. Finally, the developmental process of most tours is capped by a decline in importance. This can occur to the point that the tourist locale is only sparingly visited or the locale is abandoned entirely. At Yellowstone, for instance, the historic importance of each "natural wonder" as a locale for tourist visitation can be examined. Often, such areas can

demonstrate some kind of revival based on new fads in tourism or new philosophical approaches to travel and leisure.

Whatever the aspect a developmental cycle demonstrates, the research should identify changes in the nature and style of symbolic forms prevailing during each period of a tour arena's existence. Present forms and those of the not-so-distant-past may be determined through observation and interviews. Those occurring during historic periods can often be documented through the study of personal documents.

Architecture

Much information is available about the general nature of the architecture at each historic site. Data sources include photographs, architectural plans, and detailed inventories of structures. However, the amount of information available for each site is extremely variable and often focuses on the larger aspects of the dominant architectural entity such as a hotel's design style, number of and placement of windows and doors, etc. (Wheaton 1982; Wilson 1982). An archeological approach could fill in the details of each site's architectural and site plan, particularly where details of secondary structures are concerned. Questions which could be potentially addressed at each site location are presented in Table 1.8

Table 1.8 Research questions and potential data sources related to architecture at Yellowstone National Park

Research question	Archival data sources	Archeological data sources
1. What kinds of hardware were used on structures of various functions?	1a. Orders for goods and inventories	1a. Recovery of hardware from surface or subsurface deposits
2. How did the architecture reflect the construction and stylistic philosophy(ies) of the period?	2a. Construction manuals 2b. Architectural histories 2c. Architectural plans 2d. Photographs 2e. Structural inventories	2a. Surface survey and excavations 2b. Recovery and mapping of extant architectural elements 2c. Recovery of construction materials and building hardware
3. Where were the walkways, trails, paths, gardens, fences, etc.?	3a. Architectural plans 3b. Photographs 3c. Site maps 3d. Park maps 3e. Government records	3a. Surface survey and excavations 3b. Recovery and mapping of construction materials
4. What were the sequences of construction at each site?	4a. Architectural plans	4a. Surface survey and excavations

Table 1.8 (continued)

Research question	Archival data sources	Archeological data sources
	4b. Photographs 4c. Site maps 4d. Park maps 4e. Government records	4b. Recovery and mapping of construction materials 4c. Documenting stratigraphic changes 4d. Dating construction periods using temporally diagnostic artifacts

Subsistence

One of the more prominent changes in the various tourist support facilities is that which took place in the subsistence of the park's occupants and visitors over time. Data sources for such issues dealing with subsistence include inventories, shipping manifests, oral history, and food-related artifacts from archeological sites. Some questions which may be addressed are presented in Table 1.9

Table 1.9 Research questions and potential data sources related to subsistence at Yellowstone National Park

Research question	Archival data sources	Archeological data sources
1. Where were the Chinese gardens and what are their similarities with Chinese gardens documented for adjacent areas?	1a. Military records 1b. Oral histories 1c. Secondary historic accounts	1a. Site survey 1b. Excavations for recovery of objects of Chinese manufacture 1c. Site reports from California, Oregon, Washington, Idaho, Utah, Wyoming, Montana, and Nevada
2. What native food resources were used during each period?	2a. Government documents 2b. Tourist business records 2c. Oral histories 2d. Personal journals	2a. Recovery of faunal and floral remains through excavations
3. What were the domestic plants and livestock used during each period and from where were they acquired?	3a. Government documents 3b. Tourist business records 3c. Oral histories 3d. Personal journals	3a. Recovery of faunal and floral remains through excavations
4. What industrially packaged commercial foodstuffs	4a. Government documents	4a. Recovery of food and beverage containers

Table 1.9 (continued)

Research question	Archival data sources	Archeological data sources
were brought into the park?	4b. Tourist business records 4c. Oral histories 4d. Personal journals	through surface surveys and excavations
5. What was the relative importance of each food source?	5a. All of the above sources	5a. All of the above sources
6. How did these various elements change through time?	6a. All of the above sources	6a. All of the above sources

Status and Ethnicity

A few questions which related to the subjects of status and ethnicity are listed in Table 1.10. One of the more interesting aspects of Yellowstone ethnicity issues is its late 19th- and early-20th-century Chinese component. It is known that Chinese individuals had a supporting role in the military operation of the fort in that at least

Table 1.10 Research questions and potential data sources related to ethnicity and status at Yellowstone National Park

Research question	Archival data sources	Archeological data sources
1. Is status and ethnicity reflected in diet?	1a. All sources listed in Table 12	1a. All sources listed in Table 1.9
2. Where are the Chinese occupations?	2a. Government documents 2b. Tourist business records 2c. Oral histories 2d. Personal journals	2a. Surface survey for sites bearing artifacts of Chinese manufacture
3. What was the nature of Chinese employment?	3a. Government documents 3b. Tourist business records 3c. Oral histories 3d. Personal journals	3a. Surface survey for sites bearing artifacts of Chinese manufacture 3b. Excavation of sites and analysis of site plans and artifact patterns s
4. Can the material culture differences between the officers' and enlisted men's occupations be distinguished?	4a. Military records 4b. Military inventories 4c. Oral histories 4d. Personal journals	4a. Excavation of military dumps 4b. Excavation of latrines associated with housing units 4c. Comparison of material culture and subsistence-related materials

one Chinese man supplied fresh vegetables for the military table (Haines n.d., 1977b). These products were also acquired by other civilian groups upon occasion. It is known, as well, that there was a Chinese laundry at Mammoth Hot Springs at the former site of McCartney Hotel (Haines n.d., 1977a). Chinese porcelain has been recovered at Norris Hotel site (Sudderth 1993) and the author has seen this type of porcelain at the Fountain Hotel site. However, very little is actually known about these or other unidentified Chinese individuals in the park. What were their roles? How did they live? Did they have families or did they live alone? Where are their domiciles? Questions of this type could go on almost ad infinitum and should be addressed. It appears that there is very little information in the historic documentation for the park on the Chinese presence. The primary data source for any research on the individual house-holds, their activities, and "community" (if there was one) must therefore be archeological.

Health and Sanitation

Little is known about health and sanitation practices in a frontier setting such as that at Yellowstone during Periods I and II. Further, the fields of modern medicine and sanitation were virtually created between the establishment of the park in 1872–1942. To some degree, these issues can be studied in the historic documentation for Yellowstone. The major sources of information would appear to be military post surgeon's medical records and the archeological investigation of trash and other waste disposal sites. A brief list of questions which can be asked is presented in Table 1.11.

Table 1.11 Research questions and potential data sources related to health and sanitation at Yellowstone National Park

Research question	Archival data sources	Archeological data sources
1. What types of medicines or medical aid was available at each site type?	1a. Army medical records 1b. Oral histories 1c. Journals	1a. Surface surveys and excavations for purpose of recovering medicinal bottles, implements
2. Did any of these elements differ from one park manifestation to another (e.g., Fort Yellowstone, the soldier stations, the elite hotels, the tent camps, etc.)?	2a. Same as "1"	2a. Same as "1a"
3. Did the placement of privies and trash deposits vary from one type of site to another?	3a. Maps	
4. What are the changes that may be observed through time within a particular site type or between site types?	4a. Same as "1"	4a. Same as above sources

Additional research questions could be developed for such topics as transportation, illegal activities (such as poaching), military activities, entertainment and indulgences, furnishings and food preparation in domestic and commercial settings, mining and quarrying activities, commercial fishing and hunting, logging, etc. Obviously, research topics and the list of particular questions which can be asked are virtually unlimited. This is simply because Yellowstone represents an extremely diverse, constantly evolving cultural community and one which has some substantial time depth. Archeological data from Yellowstone historic sites, particularly the dumps, are critical to understanding the park's cultural history and are in some cases the only sources of information available.

Conclusions

Visitors to Yellowstone National Park tend to view it as a pristine wilderness devoid of cultural impacts. While Native American occupations (and prehistoric sites) are accepted as important part of the "natural landscape," historic sites have not generally received similar acceptance as significant park elements. Nevertheless, Yellowstone and other national and state parks contain hundreds of historical archeological sites which are complex in form, content, and functional association. Faced with this complexity, archeologists have often found themselves somewhat less than successful with regard to developing historic contexts useful for investigating, understanding, and assessing the significance of these resources. Tourism, long considered a valid field of inquiry for anthropology, can serve as such a context. The history of tourism in America demonstrates considerable alteration, changes which can be charted locally, regionally, and temporally. While the model of tourism has been developed for archeologists working with historic sites in Yellowstone, the approach developed here is sufficiently general to allow the context's adaptation and application to other locales where tourism is or has been the major economic focus and where sites relating to the operation and maintenance of the tourist industry can be expected to exist.

A brief review of archeological data from Yellowstone certainly did not examine all historical archeological resources identified to date within the park. It nevertheless demonstrates the broad adaptability of the model, especially for sites within the original park boundaries.[16] In fact, researchers have been successfully applying this model to newly recorded sites for several years as an aid to assessing significance with regard to eligibility for the National Register of Historic Places. The model opens future research to examinations of cultural landscapes, tourism economics, architecture, and other issues which can elucidate the nature and development of tourism. It provides a reference for historical archeologists working in Yellowstone National Park and other tourist locales. It also provides research questions as the next step in investigative areas beyond simple identification, one where changes through time, space, and site function can be better understood and demonstrated through detailed examination of the physical remnants of human behavior.

Acknowledgments The development of the tourism model was a by-product of a number of years of archeological investigations by the author and others in Yellowstone National Park after the "Great Fire" of 1988. It was developed as the primary element of Yellowstone's Archeological Treatment Plan for historic sites and was prepared after months of archival research and consultation with several people who have immersed themselves in the history of the park. Most notable is the late Yellowstone historian Aubrey Haines. Aubrey freely opened his home, mind, and research files to me, providing information he had gathered over a lifetime as a Yellowstone National Park Ranger and park historian. I also often turned to Aubrey's "children," the next generation of researchers active in studying Yellowstone history. Prominent among these are former NPS Rocky Mountain Regional Historian Mary (Marcie) Culpin, Yellowstone National Park Resource Naturalist Paul Schullery, and Yellowstone National Park Archivist Lee Whittlesey. Lee, especially, has generously offered his time, information, and access to Yellowstone historical materials. He has reviewed past manuscripts, gently corrected my mistakes, and offered much-needed clarification of details. Guidance in preparation of the original Treatment Plan and opportunities to conduct archeological investigations in the park over the past 16 years was made possible by Yellowstone National Park Archeologist Ann Johnson. My work at Yellowstone and subsequent research into Yellowstone historical archeology was generously supported by MWAC Manager Mark Lynott, former Midwest Archeological Center (MWAC) Chief F.C. "Cal" Calabrese, former MWAC Division Chief for Rocky Mountain Research Douglas Scott, former Rocky Mountain Regional Archeologist Adrienne Anderson, and former Rocky Mountain Regional Architect Rodd Wheaton. Many NPS and concessions employees working in Yellowstone have generously spent time with me and provided information useful in the development of the tourism model and other archeological investigations I was fortunate enough to conduct in the park. I would especially like to mention the late Yellowstone Research Geologist Roderick "Rick" Hutchinson and Yellowstone's Lake District Ranger John Lounsbury. Finally, I would like to extend my appreciation to PAST Foundation Executive Director Annalies Corbin, co-Principal Investigatory in my most recent Yellowstone research venture at the Marshall/Firehole Hotel site, and for providing this venue for publishing this long-overdue article. Of course, any errors in fact or theory which may occur in this document are entirely my own.

Notes

1. Interestingly enough, for adherents to the "Natural Park Myth," the built-in bias against historic sites does not hold equally for prehistoric or historic Native American resources. Native American sites are relatively common in virtually all natural parks and the myth is bent accordingly to accommodate them. The perspective holds that such sites, and particularly the prehistoric sites, are actually "natural" or at least "more natural" than EuroAmerican historic sites. As an anonymous Yellowstone National Park employee explained it in 1989, prehistoric people were simply an element of nature living in a symbiotic relationship with the wilderness. This view recognizes that prehistoric people did leave physical evidence of their activities in the park and that evidence clearly generates considerable interest on the part of both the public as well as the park staff. This interest is derived from the fact that they represent, at least in part, the exotic. The objects and sites were created by people who were very different culturally from the modern American. Further, the sites are often of extreme age, a factor which tends to attract the antiquarian side of many. These perceptions are enhanced by their seeming scarcity, an erroneous perception based upon the fact that (at least for the uninitiated) prehistoric sites are frequently vague and hard to see.
2. This is equally true for virtually all of the large, heavily visited holdings in the National Park system.
3. This process was likely begun with the first road through the park. Superintendent Philetus Norris constructed the first crude road from Mammoth Hot Springs to the Lower Geyser Basin in 1878 (Haines 1977a:242).

4. In 1909, 1,372 horses were required to transport tourists through the park. Many additional animals were also in use to haul freight and supplies to the hotels and businesses inside the park. In 1916, NPS Director Stephen T. Mather required park transportation companies to merge and convert from horse-drawn to motorized conveyances, a process that completely transformed the Yellowstone tourist industry (Haines 1977b:257, 259, 273–4). Nevertheless, horses and mules remained an important element in the park for decades thereafter. Park rangers used horses on their patrols after World War I and draft animals continued to be of importance in road construction through the 1930s.
5. "Rehabilitation" projects, while reducing the visual impact of the scar, can never entirely remove the physical consequences of ground disturbance.
6. The emphasis on "natural park" has affected the allocation of park funds to identify and protect its cultural resources. According to one source, "Although the increased interest in cultural preservation at Yellowstone reflects a trend in the entire national park system, many of these resources have received relatively little attention because Yellowstone has been valued primarily as a "natural" park. Management of the park's cultural resources has been hampered by insufficient staff, funding, and facilities. Since 1988, when Yellowstone had only one full-time employee devoted to cultural resources, the program has grown through additional staff and increased cooperation with park partners. . .. Nonetheless, according to a 1997 service-wide analysis that was based on the extent of each park's cultural resources, Yellowstone still needs to significantly upgrade its cultural resources staff. Legislation passed in 1998 compels the park to inventory and document all of its cultural resources and develop systematic monitoring and protection programs for them. In some cases, the resources may be gone already" (Yellowstone Media Group, Inc. 1999–2003).
7. A consequence of the natural/cultural debate has been to make the discipline of historical archeology a controversial area of study in the "natural" National Park. Somewhat surprisingly and perhaps unwittingly, a major contributor to the unsettled character of the "natural versus cultural debate" in the "natural" National Parks has been the archeological community itself. For example, at Yellowstone National Park, historical archeologists have generally been unable to identify and clearly explain the significance of the park's historic sites in convincing terms that non-archeologists can appreciate (Hunt 1994a).
8. As evidence of this, is the Fourth Biennial Scientific Conference on the Greater Yellowstone Ecosystem held in 1997 at Mammoth Hot Springs. At this conference, Yellowstone National Park acknowledged its rich cultural history through a series of presentations examining humanities-related research in the park including historical archeology, Native American history, architecture, interpretation, the history of naturalist research, and other topics (Schullery and Stevenson 2005).
9. The plan also presented: (a) fieldwork and analytical methodology and strategies applicable to the project area as a whole along with an explanation of their relevance to the research questions; (b) procedures for dealing with discovery situations; (c) provisions for the curation and disposition of all recovered cultural materials, samples, and records; and (d) contents of a comprehensive synthesis and final report concerning mitigation activities.
10. Types include artifact scatters, artifact scatter and depression, artifact scatter, depression, and structure, artifact scatter and hearth/fire pit, artifact scatter and rock wall, artifact scatter, road, and structure, artifact scatter and structure, artifact scatter and trail, artifact scatter and water control feature, bridge, bridge and structure, burial/human remains, cache/storage feature, cairn, cairn and camp; camp; depression, district, dump, habitation, log pile, mine/quarry or quarry, natural shelter, parking area, railroad grade, ranch, road, road and structure, rock alignment, rock art, rock feature, scarred tree, shipwreck, structure, tourist attraction, trail, trash dump/midden, water control feature, and undetermined.
11. Witness the recent political turmoil surrounding snowmobile access to the park, for instance.
12. In 1917, Col. Amos A. Fries, in charge of road construction and repair in Yellowstone from 1914 to 1917, wrote to Acting National Park Service Director Horace Albright about this issue: "The Transportation Company doesn't seem to appreciate that everything they have in

the world came from the roads and that all the fortunes they expect to make in the future will come from the same place" (Culpin 1994:85).

13. The general histories of each period are largely drawn from Haines' monumental two-volume work, *The Yellowstone Story* (Haines 1977a,b) supplemented by some materials from Haines (1996c), Culpin (1994, 2003), and Whittlesey (1988).
14. "For the visitor there were two possible routes; by Union Pacific Railway to Corinne, and then by dusty, bone-jolting stage coach northward across Idaho into Montana Territory; or, by (by rail across Dakota Territory to the town of Bismarck, where one transferred to a) Missouri River packet. . . to Fort Benton or such other Montana landing as the seasonal fluctuation of the river allowed; then it was again a matter of tedious staging to reach one of the outfitting towns, Virginia City or Bozeman. Regardless of which route the visitor came by, there were only those two jumping-off places for a park tour, and beyond them he was largely on his own" (Haines 1977a:193).
15. At this point in time, some archeological sites within the current park boundaries are associated with ranching, mining, and 1877 Nez Perce War.
16. Later additions of the park contain many sites which are better understood within other economic contexts, especially ranching and mining.

Chapter 2
Maritime Archeology of Tourism in Yellowstone National Park

Matthew A. Russell, Larry E. Murphy, and James E. Bradford

This chapter reports on an investigation of Yellowstone National Park's unique maritime heritage and focuses on material remains of the park's 19th- and early-20th-century tourist infrastructure in Yellowstone Lake. These sites were examined within the overall framework of the historical archeology of tourism developed by Hunt (1994c; Chapter 1 of this volume), but they represent distinctive examples of an underwater cultural heritage not previously investigated in the park. Like their counterparts on land, these sites are linked to the broader context of Yellowstone National Park's status as one of the premier tourist destinations in the American West.

Maritime tourist infrastructure development on Yellowstone Lake did not occur in a cultural vacuum. Though isolated spatially, tourist development in late-19th-century Yellowstone National Park was directly linked to the larger capitalist world-system and to the social and economic processes taking place elsewhere in the nation. The creation and successful marketing of Yellowstone was tied to two simultaneous mid-19th-century phenomena. First, industrial expansion and the westward push by railroads opened up previously inaccessible areas to outside visitation. Second, the same industrial expansion created demand for mass tourism and new recreational opportunities, along with the requisite support infrastructure.

The research perspective used in this study links maritime archeological sites in Yellowstone Lake to the larger tourist system that developed in Yellowstone National Park after its creation in 1872 (see Hunt, Chapter 1 of this volume), as well as to the broader economic context in which the park was created. Underwater sites investigated in this chapter are interconnected in what we term the "Yellowstone Lake Maritime System" (Russell et al. 2004). We use the concept of a maritime system to demonstrate that to truly understand the unique nature of these maritime sites, they must be interpreted in a broad context, not in isolation. Traditional maritime systems that represent global interconnections inform on more typical aspects of the capitalist world-system, such as core/periphery production, supply

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relationships, and trade patterns (Wallerstein 1974, 1980, 1989). The Yellowstone maritime system is more tightly focused to illuminate post-industrial tourism as a by-product of capitalism. The Yellowstone maritime system did not involve shipment of market goods, the primary function of most maritime systems. Instead, its development catered solely to an emerging tourist trade backed and marketed by the Northern Pacific Railroad. In this regard, like other historical archeological sites in Yellowstone National Park, underwater archeological sites in Yellowstone Lake can be interpreted within the overall context of tourism (Hunt 1994c, Chapter 1 of this volume; Corbin et al. 2003) and, more widely, as a component of the capitalist world-system (Russell et al. 2004).

Tourism has a long academic history as a subject of anthropological inquiry (Smith 1978; Nash 1981; Graburn 1983; Crick 1989), but has only relatively recently become the subject of archeological study (Hunt 1994c; Corbin et al. 2003; Russell et al. 2004). Tourism is a complex worldwide process that perhaps represents the largest non-military movement of human populations (Greenwood 1972:82) and is responsible for extensive cultural contact and social change. Tourism is unique in transportation in that the consumers themselves travel to collect experiences rather than goods being transported for consumption (Crick 1989:334), which necessitates development of extensive infrastructure able to move and support people in sometimes very isolated areas. In this study, tourism is utilized as a historical context through which a local maritime system is examined.

It is surprising to most that one of the largest water bodies in National Park Service (NPS) jurisdiction is in Wyoming, within Yellowstone National Park. Those most familiar with parks on the Atlantic, Pacific, and Gulf of Mexico coasts are often astonished to learn that Yellowstone Lake encompasses a water surface rivaling Biscayne National Park and larger than that of Dry Tortugas National Park. Yellowstone Lake is not just large – it is deep. Average Yellowstone Lake depths exceed most other NPS areas, with the possible exception of Lake Superior's Isle Royale National Park and California's Crater Lake.

Yellowstone Lake, with more than 100 square miles of surface area (160 km^2), dwarfs the other 75 ponds and lakes in Yellowstone National Park (Fig. 2.1). Centuries before the idea of the world's first national park was discussed around a frontier campfire, Yellowstone Lake was the focus of much human activity. Native American groups had long been moving through the area, hunting and living along the shores of this high-altitude, volcanic lake. How many indigenous sites occur along the lake shores is unknown, but evidence indicates a long history of human occupation and use of the unusual area associated with Yellowstone Lake.

The earliest European American activities in the area mirrored those of Native Americans. However, these activities shifted toward scientific studies by the 1870s and, before the end of the century, included recreation, with heavy influence from concessionaires catering to the growing tourist trade. The period 1860–1890 was one of sweeping changes in American society that included widespread settlement of the American West and a major change in the nation's economic focus from agriculture to industry. Westward industrial expansion, led by mammoth railroad monopolies, had a curious and unexpected by-product: creation of many of the

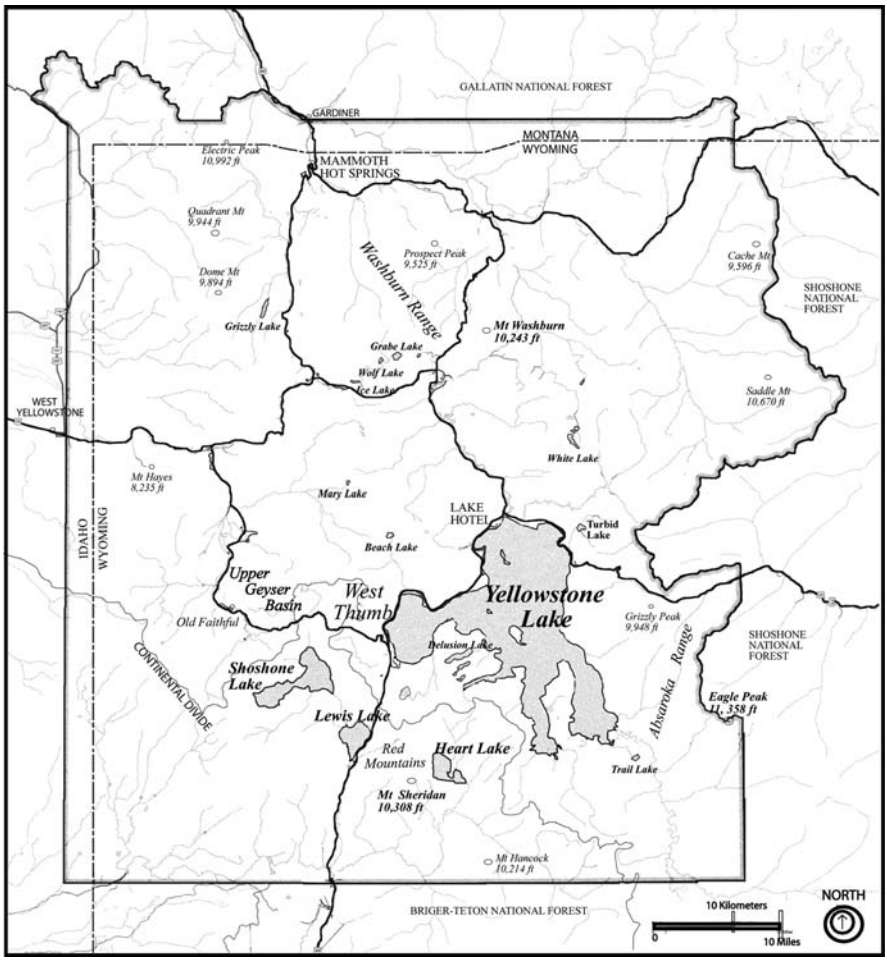

Fig. 2.1 Yellowstone National Park

nation's largest and most spectacular national parks and the promotion of tourism. After being designated as the world's first national park in 1872, thanks largely to the influence of the Northern Pacific Railroad, Yellowstone National Park became a popular turn-of-the-century tourist destination. To facilitate and stimulate visitor access, the Northern Pacific backed development of an extensive tourist infrastructure, including hotels, roads, and a vast transportation network. In response to increasing numbers of tourists, a unique maritime system developed on Yellowstone Lake, including passenger steamers, docking and marine railway facilities, a rental boat fleet – all of which culminated with tour vessel *E. C. Waters*' launch in 1905. This 38-m (125-ft) wooden-hulled screw steamer was the largest ever to operate on Yellowstone Lake.

European American sites, many related to the maritime system and integral to the park's history, are numerous around Yellowstone Lake, although the number and full range of these sites is still under investigation. Park management recognized the importance of these archeological sites and began a program to methodically survey, inventory, and evaluate them for their management, protection, and interpretation. Terrestrial archeological surveys and excavations were conducted in many park areas, including some portions of the Yellowstone Lake shoreline.

The investigation of maritime sites related to Yellowstone's tourist infrastructure began as a result of discussions between the NPS Submerged Resources Center (SRC) and park management in 1995 during an archeological reconnaissance (Lenihan 1995a, 1995b). This led to SRC being asked to provide technical information on Yellowstone Lake physiography for natural resource issues in 1996. Yellowstone scientists became aware of SRC's systematic remote sensing of natural resources in other park areas, particularly Biscayne and Dry Tortugas National Parks. An important question facing Yellowstone natural resource scientists was how to control proliferation of exotic lake trout that compete with native trout in Yellowstone Lake. Fisheries biologists wished to determine whether methods developed by SRC for seabed classification would be appropriate for classifying lakebed sediments in order to understand their relationship to lake trout breeding. Having demonstrated the cost-effective benefits of multi-resource investigations, SRC accepted the opportunity afforded by this natural resource investigation to collect information on submerged cultural resources at the same time. Effective submerged cultural resources investigation and management requires consideration and incorporation of natural resources in a multidisciplinary approach. Natural resource investigation is core to all SRC research, whether to characterize archeological site formation processes or for environmental context. This combined natural and cultural resources approach, which utilizes a single team and mobilization, again proved effective and cost-efficient during this project (Bradford et al. 2003).

The project's cultural resource component was designed to accomplish two goals. First, to investigate selected shoreline archeological sites and submerged near-shore features related to the history of Yellowstone Lake, including pre-contact and post-contact Native American sites, and historical European American features such as boat docks, watercraft remains and other material culture scatters. Second, to conduct side scan sonar survey to locate submerged watercraft remains, including small boats near the old Lake Hotel dock and *Zillah*, the first large lake tour boat, reported to have been sunk near the lake's northern end. Although park divers have observed submerged near-shore features near the Lake Hotel and West Thumb Geyser Basin, no systematic archeological survey of these areas were previously conducted.

The investigation of Yellowstone Lake's maritime tourism was originally designed to acquire substantial information on lake submerged archeological sites selected by park managers. During the survey, SRC researchers were greeted by geological features unique to Yellowstone and by remarkable vestiges of human occupation that stretch from prehistory through the stagecoach era to steam-powered tour boats. Underwater, researchers observed hot springs emerging in the lake and, with side scan sonar, strange mineral formations resembling volcano cones and tall, thin

spires rising high from the lakebed. The long procession of human visitors to this extraordinary landscape is well represented by material remains in and around the lake. The archeological team recorded many submerged structures and small boats in addition to the primary target for documentation, *E. C. Waters*. These archeological features are material evidence of adaptations developed to meet the challenges of navigating this large, isolated, high mountain lake and material remains of America's diverse and long-standing involvement with this park. The body of water upon which watercrafts operate influences their design, and our team is among the few to have the opportunity to investigate Western mountain lake vessels.

Our broader research questions focused on how the "Yellowstone Lake Maritime System" fits into the larger, interconnected system of the late-19th-century Western tourism and industrial capitalist expansion, and how the material record reflects the differences and similarities of the Yellowstone maritime system when compared to other contemporary maritime systems, such as on the Great Lakes. We believed the archeological record should reflect similarities with other regions because of the system's link to the larger process of industrial development and its connection in a world-system, but also expected differences to be present because of the unique environmental setting (a high-mountain lake not connected to other navigable waterways) and the nature of the trade (which did not involve shipping goods, but existed solely to support tourism) (Russell et al. 2004).

This chapter begins by developing a specific historical context for Yellowstone Lake, highlighting the role tourism played in creating the structures and vessel remains present in the lake today, as well as how they were connected to the outside world. We then briefly discuss previous archeological work around Yellowstone Lake, which served as a baseline for the survey reported here. The chapter then outlines the idea of a maritime system as a subset of the larger tourist system at work in Yellowstone National Park and as a framework for interpreting maritime archeological remains found in Yellowstone Lake. This is followed by a detailed discussion of the archeological sites we recorded in the lake. Finally, we conclude with a variety of recommendations for future research.

Yellowstone Lake and Tourism: Historical Context

Between 1860 and 1890, rapid westward expansion and settlement occurred in response to the search for minerals. With the discovery of gold and silver in the Rocky Mountains, prospectors and miners led an influx of settlers into the region more quickly than expected from exploitation of other resources. Mining quickly became the focal point for regional settlement, and as communities grew up around mining locations, trade and agriculture concentrated on supplying mining settlements. This development process led to demand for improved transportation systems, including rail, coach, and steamboat. Widespread late-19th-century Western settlement fueled the United States' national economic development through expansion of the resource base, increasing markets for eastern manufactured goods,

impelling improvements in transportation, and encouraging foreign investment in mining, ranching, and railroads (Fite and Reese 1965:315,318). Westward settlement, largely an eastward flow of people from the West Coast, was so complete that it prompted the often-cited 1890 declaration by the Census Bureau that a "frontier" no longer existed in the United States (Paul 1963:viii). In general, the period 1860–1890 witnessed a transition from western agriculture to eastern industry as the dominant economic factor in the United States. After 1890, the economic importance of Western settlement and agriculture rapidly declined as industry ascended (Fite and Reese 1965:296).

Partly in response to increased demand from the West, and fueled by increased industrialization in the East, the railroad monopolies pushed westward, opening up huge western land tracts to increased settlement and visitation. Between 1865 and 1920, total railroad mileage in the United States increased from 37,000 to 253,000 miles (60 000/407 000 km), and rail passengers increased 400% between 1882 and 1920 (Fite and Reese 1965:324,326). Expansion of the nation's rail network coincided with and capitalized on creation of a tourist class in search of new and interesting destinations. As a result, Yellowstone National Park was a focal point for Western tourism; within the park, Yellowstone Lake became a popular tourist destination.

Yellowstone Lake occupies the central Yellowstone Plateau. By the time ancient humans arrived on the plateau, there were many lakes, ponds, and streams created by melting glacial ice. Yellowstone Lake was the region's largest, and its present size of 139 square miles (224 km^2) makes it the United States' largest natural, high-elevation lake (Whittlesey 1988:167–168). Yellowstone Lake, like most freshwater sources, was a focal point for human activity.

Yellowstone Lake's Ancient History

Archeological evidence from Yellowstone National Park reflects more than 10,000 years of human utilization, beginning at the end of the last ice age with seasonal occupation by highly mobile hunting bands possessing varied material culture. The scant material evidence indicates only rare and brief sojourns onto the plateau to hunt modern species and now-extinct Pleistocene herd animals such as mammoth, horse, and giant bison and to gather supplemental wild food plants.

Artifacts from Fishing Bridge peninsula on Yellowstone Lake's east shore indicate the lakeshores were probably used as early as 8,000 B.C.E. and certainly by about 7,000 B.C.E. (Reeve 1989; Cannon 1993:9). Sometime around 6,500 B.C.E., many Pleistocene megafauna species died off as the climate changed to a warmer, drier regime. Rainfall remained abundant in the mountains, and succeeding human occupations continued into Late Prehistoric times. The most intensive lake use was during either Middle to Late Archaic times (3,000–900 B.C.E.) or during the Late Prehistoric period (up to A.D.1500). Many precontact sites, some quite large, from

both periods have been located around Yellowstone Lake (Taylor et al. 1964; Reeve 1989; Cannon 1993).

Yellowstone's indigenous human occupation is often referred to as limited or transient, but the archeological evidence indicates a long history of Native American use. This archeological evidence supports Native American origin stories and ethnohistorical accounts from several tribes that describe the Yellowstone Lake region as their ancestral homeland or place of origin. Groups claiming ties to Yellowstone Lake include the Kiowa (Mooney 1979), Shoshone (Dominick 1964; Wright 1978), and Apache groups (Perry 1980), particularly the Kiowa-Apache (Gunnerson and Gunnerson 1971:14).

By the late 1600s, introduction of the modern horse into the northern plains drastically changed subsistence patterns of indigenous cultures. Pedestrian bands became more mobile and much faster with the horse, so groups hunted plains bison more and used the mountains less (Haines 1996a:8). By the time European Americans first penetrated the Yellowstone Plateau in the early 1800s, the plateau was largely abandoned except for occasional trips through the area by the Shoshone, Piegan (Blackfeet), Crow and Bannocks, and the more distant Flatheads and Nez Perce to the north and west along established trails. Indigenous groups used a variety of trails through Yellowstone, many of which were ancient and much-traveled, although most had fallen into infrequent use (Chittenden 1924:7–9). The Great Bannock Trail through the park's northern section was the major east–west thoroughfare with other trails forming minor connecting routes in other directions. Yellowstone Lake appears to have been a major landmark in north–south travel, and sites associated with these movements are likely present along its shores.

One exception to general plateau abandonment was a Native American group referred to as the "Sheepeaters," described as Shoshonis who had ". . .retained the old way of living from the time before horses were introduced and who established a specialized mountain culture" (Haines 1996a:24). The first recorded European American observation of Sheepeaters is from 1835 when a party of Lamar Valley trappers led by Osborne Russell encountered them (Haines 1996a:49). Early European American explorer accounts of the region suggest that most Indian groups, including Sheepeaters, were generally unfamiliar with the area beyond specific areas they frequented. Apparently, they were unaware of the main geyser basins' thermal features (Chittenden 1924:9–12). Sheepeater diet included fish, which indicates they probably utilized, and perhaps seasonally occupied, Yellowstone Lake shores. European American encounters occurred until the Sheepeaters were dispossessed of their lands in 1851. Their lands were ceded by treaty with the United States to the Piegan and Crow, who, in turn, lost them in an 1868 treaty (Hodge 1910:378; Haines 1996a:27).

Archeological evidence of Yellowstone Lake fishing is scant, although some has been observed. A submerged feature just offshore an occupation site northeast of Bridge Bay has been suggested as a fish weir (Johnson and Lippencott 1989:41; John Lounsbury, 1996, personal communication). Net-weight sinkers were found in archeological sites south of the lake and along the Yellowstone River. Fish bones were recovered from a roasting pit at site 24YE3 (Ann Johnson, 1997, personal

communication). There is only a single mention of Indian watercraft in the ethnohistorical literature – an entry by Norris (1880:37) who ". . .saw a rude canoe at the lower rapids of the Upper Yellowstone, and probably others have been used by both Indians and white men. . .."

Yellowstone Lake's Historic Period

It is generally agreed that John Colter, a member of the 1803–1806 Lewis and Clark expedition, was the first European American to view Yellowstone Lake. In his 500-mile (805-km) solo trek through the Northern Rockies in the winter of 1807–1808, Colter walked along the lake's west side during his return to the Bighorn River (Haines 1996a:35–38). In 1827, trapper Daniel Potts described Yellowstone Lake as ". . .a large fresh water Lake . . . on the very top of the Mountain . . . and as clear as crystal. . ." (Haines 1996a:41). Many trapping parties probably camped by the lake after 1826 and Osborne Russell made five trips into the Yellowstone country between 1835 and 1839. Although Yellowstone Lake was the original objective of his 1835 trip, (its location had been drawn for him by a Sheepeater on a hide map), he instead trapped in the surrounding mountains (Haines 1996a:48). Russell returned in summer 1836 trapping in the lake's marshy south shore area where the Yellowstone River enters. From there, he traveled up the lake's east side to Pelican Creek exiting the region to the north at summer's end (Haines 1996a:50). Russell returned to the area twice in 1839. During the second trip while camping at Pelican Creek, Piegan Indians attacked his party, and he escaped along Yellowstone Lake's west shore to the Snake River (Haines 1996a:51–52). Also in 1839, Indians attacked a group of 40 trappers traveling the lake's east shore near Mary Bay just south of Pelican Creek (Haines 1996a:52). Trappers were only interested in beaver; their association with Yellowstone Lake was trapping where the Yellowstone River connects and using established shore trails. Warren Angus Ferris, an American Fur Company clerk, was probably the first "tourist" to visit Yellowstone. Ferris traveled to Yellowstone specifically to see the geological wonders, rather than for solely commercial reasons (Haines 1996a:46–47).

For the next 20 years, few European Americans visited Yellowstone territory, but gold strikes in the early 1860s brought an incursion of miners to the Idaho-Montana region. By the end of this period, miners had explored most parts of the future park, and many undoubtedly saw Yellowstone Lake. At least nine mining expeditions entered park territory between 1863 and 1870. The 1864 Phelps-Davis party skirted the lake's eastern edge, and, in 1866, George Huston mentioned a "horse-thief trail" along the west side of Yellowstone Lake (Haines 1996a:75). Both mining groups and horse thieves were apparently taking advantage of earlier Indian and trapper trails through the area. Like the trappers, miners' interest was commercial, and their association with the lake was incidental. Before 1869, when the first expedition was organized to specifically inspect and record Yellowstone's unique natural fea-

tures, Yellowstone Lake's importance was likely limited to providing fish for Native Americans, trappers, and miners.

The 1870s was a decade of scientific study for Yellowstone. Although visitors to the area continued to mention Yellowstone Lake's productive fishing, it is during this period that direct use of Yellowstone Lake for transportation is first mentioned.

Yellowstone Lake's Early Watercraft

The First Rafts

The first recorded Yellowstone Lake watercraft was a small raft built in September 1870, by the Washburn expedition. The builders assumed lake islands had "...doubtless ... never been trodden by human footsteps" (*Helena Herald* November 9, 1870). In a single sentence of his 1870 official report, Washburn expedition member Lt. G. C. Doane noted the raft's fate and characterized Yellowstone Lake navigation: "We built a raft for the purpose of attempting to visit them [the islands], but the strong waves of the lake dashed it to pieces in an hour" (Cramton 1932:130). Fellow expedition member C. Hedges provided more detail:

> The wonderful beauty of the lake had wrought a charm over almost the entire party, and around the evening camp fire we voted to traverse the entire lake shore. . . . We would build a raft, raise a blanket sail, and visit the wooded islands; we would visit every nook and corner. . . . Our attempt at raft building was such an utter and ignominious failure that the subject was dropped by mutual consent. The wind was always from the wrong direction, the waves rolled unnecessarily high, the water was evidently deep and unmistakably cold, the islands distant, and the logs altogether too much inclined to slip their cables and strike out in their individual capacity. The toil of a day was the wreck of a few moments, and we hushed our disgust with the glad reflection that we had never got away on it, and quit the subject by promising ourselves to bring an India-rubber boat when we came again (*Helena Herald,* November 9, 1870; see also Cramton 1932:108–109).

The combined Hayden/Barlow-Heap expedition rafted the Yellowstone River near Mud Volcano in July 1871. On July 30, Captain Barlow built another raft to cross the Yellowstone River lake outlet, and with it explored east of the river to Pelican Creek (Haines 1996a:146, 148). In 1873, a Corps of Engineers raft was launched on the Yellowstone River at its lake outlet, although the two Corps members had only slightly more success than their predecessors. Near the river outlet the two topographers, Paul LeHardy and Gabbet began a river trip that ended with their raft wrecked in the rapids (Haines 1996a:201). The men survived, and LeHardy Rapids gained its name. Whittlesey (1988:167) mentions that in 1874, US Government surveyors constructed a raft to conduct their business around the lake, but no other information is offered.

Early Boats

The first successful lake navigation in a boat occurred during the 1871 Hayden expedition. Hayden's group brought a collapsible, canvas-and-wood-frame sailboat for

Fig. 2.2 The canvas-and-frame boat *Anna*, the first boat on Yellowstone Lake, 1871 (W. H. Jackson photograph 273). Haines (1996a:147) attributes the misspelled name to the photographer altering the negative

lake exploration (Fig. 2.2). The craft was named *Anna* in honor of Anna Dawes, an early and effective proponent of the national park. She was also daughter of H. D. Dawes of Massachusetts, then chairman of the House Committee on Appropriations, which helped fund the expedition, and sister to Henry Dawes, the expedition's general assistant. The 3.65-m (12-ft) boat was constructed from a wooden framework covered by tarred-canvas (Haines 1996a:148). It was primarily used for sounding Yellowstone Lake in 1871, and also used for exploring Shoshone Lake (Norris 1880:11, 37; Haines 1996a:148).

In 1874, E. S. Topping, 1872 Hayden Expedition member and one of the early park tour guides, along with Frank Williams, built a row boat and a small sail boat of green whipsawed timber at his cabin (later named Topping Point) near the foot of Yellowstone Lake (Topping 1968:123). The latter, a sloop-rigged yacht, is referred to as *Topping* by Whittlesey (1988:155) after its builder, but as *Sallie* by Topping (1968:124). It had a short life and, after "perilous service during a small portion of the seasons of 1875 and 1876, was dismantled, abandoned and finally lost" (Norris 1880:37; Whittlesey 1988:155). This was the earliest boat on the lake to provide some tourist services.

Lt. Doane, who led the military escort for the 1870 Washburn expedition, conducted a military reconnaissance of the park in the winter of 1876. One of Doane's enlisted men had operated Hayden's canvas boat *Anna* on Yellowstone Lake in 1871,

and his equipment for the 1876 reconnaissance included a small boat. The vessel was built in the post carpentry shop, dismantled and transported to the lake by mule, and reassembled with wood screws at the launch site. It was 6.70-m (22-ft) long, with a 117-cm (46-in.) beam and a 66-cm (26-in.) depth (Haines 1996a:210). When the party reached the Yellowstone Lake outlet, it took two days to assemble the boat. When ready, the party used the boat to transport supplies by towing it with a mule around the west shore. This worked well for about 24 km (15 mile), but "at Pumice Point, where it was necessary to cast off the line and row around the rocks, a large wave swamped the loaded boat, and it sank instantly. Everything was saved, but time was lost drying the cargo and repairing the damaged hull" (Haines 1996a:211). Three soldiers took the boat across West Thumb, but it was slow going against the wind, and the boat and men were coated with ice when they reunited with the others. They found the boat would not bear a cross-sea, and their only choice was to put the bow into the wind and row as hard as possible, bailing the boat each time a freezing wave caught them. The boat was transported overland to Heart Lake where it was used, again with great difficulty, to transport the group's supplies down the outlet stream to the Snake River, where it was eventually lost and the expedition abandoned (Haines 1996a:211–212).

In the summer of 1880, P. W. Norris, second superintendent of Yellowstone, had T. E. "Billy" Hofer and his brother construct a small sail boat, also of green, whipsawed lumber, measuring 6 m (20 ft) long × 1.8 m (6 ft) wide × 0.7 m (2.5 ft) deep, dubbed *Explorer*. Norris and his two companions, Captain Jack Davis and W. H. Parker, made a 10–12-day voyage in *Explorer* during which they circumnavigated Yellowstone Lake and most of its bays and fingers, and ascended Pelican Creek, the Upper Yellowstone and other streams to their rapids. These investigations did not result in any major discoveries, but they did confirm Stevenson's 1871 lake soundings. The boat, described as "loggy and clumsy," proved to be very unseaworthy and was maneuverable only with great effort. *Explorer* eventually wrecked near the point where it was built at Topping Point and was abandoned to the elements (Norris 1880:11–12).

There are brief accounts of at least two other boats on Yellowstone Lake in 1880. The first, built by T. E. Hofer for the tourist trade, did not succeed and it was reported that the boat later drifted over the Falls (Chittenden 1924:345). The second was another boat piloted by Hofer and William D. Pickett, which made at least one trip in 1880, although it was not reported for what purpose (Whittlesey 1988:167).

At least two government vessels operated on Yellowstone Lake in 1885. The first, a US Geological Survey (USGS) boat, was destroyed by lightening while making observations in northeastern Yellowstone Lake, with one fatality (Haynes 1946:104; Whittlesey 1988:167). This incident likely occurred during the Hague geological survey. The second government boat was the *US Pinafore*, a small craft tested on Swan Lake by Dan C. King of the US Army Corps of Engineers before being used on Yellowstone Lake (Whittlesey 1988:153). This boat, built by Road Foreman Lamartine, was the first Corps of Engineers vessel on Yellowstone Lake (Haines 1996b:408, n15). *US Pinafore* is not mentioned again in historical sources after its trial voyage that year (*Livingston Enterprise* August 22, 1885).

Another Corps of Engineer boat operated on Yellowstone Lake the following decade, in July 1891. It was noted at that time that ". . .the US Army Engineer Corps put on [the lake] a small boat which they use in supplying their road camps with forage and provisions and in hauling lumber from the mill to the various points where it is to be used" (Anderson 1891:7–8). In addition, Lt. Grayhill, in charge of park road construction in early 1891, hauled a 12-m (40-ft) steam launch to the lake to supply road crews working on the east end of the West Thumb-Lower Geyser Basin road (Haines 1996b:217).

Yellowstone and the Northern Pacific Railroad

Tourism, in the modern sense of the word, is a by-product of modern industrial society and the creation of leisure time and workers' paid vacations (Norris 1994:4). In anthropological terms, tourism can be defined as "leisure activity requiring travel," where leisure is freedom from primary obligations, such as work, study, and family and social responsibilities (Nash 1981:462). Tourism can also be considered ". . .that activity characterized by travel, conspicuous consumption, and pursuit of other than normal (secular) activities" (Hunt 1994c:26). A mid-19th-century "parks movement" in eastern cities can be attributed to generalized dissatisfaction with industrial culture and its effects on the landscape. This awakened interest in the beauty of the natural world, and toward the end of the 19th century, as "frontier" disappeared, "wilderness" and its preservation gained popularity (Norris 1994:5–6). The best examples of this new ethic are the 1864 federal grant to the State of California for preservation of Yosemite Valley, which achieved national park status in the 1890s; the 1872 designation of Yellowstone National Park, a milestone in wilderness preservation; and the romantic realism of Hudson River School artists such as Albert Bierstadt and Thomas Cole. Improved transportation was a key to developing protected western areas as tourist destinations, allowing tourism to merge with industrial expansion.

From the beginning, Yellowstone National Park was inextricably linked to the Northern Pacific Railroad, which began lobbying for park designation in 1870 and sponsored the Washburn–Doane Yellowstone Expedition that year to collect important information necessary for national park designation. Northern Pacific executives realized early that federal control of the land would be preferable to private control, allowing the railroad to directly profit from regional tourism by monopolizing access and tourist development. Railroad promoters recognized the potential profits tourism could bring, with scenery and unspoiled landscape as the principal market commodity. Northern Pacific lobbied heavily for passage of the Yellowstone Park Act, which was approved by the Congress on March 1, 1872. According to historian Richard W. Sellars, ". . .from the first, then, the national parks served corporate profit motives, the Northern Pacific having imposed continuous influence on the Yellowstone park proposal. . ." (Sellars 1997:9–10). The combination of federal protection and backing by private business interests ensured that tourism became an important and intrinsic part of the Western economy.

The Northern Pacific reached Livingston, Montana, 56 miles (90 km) from the northern park boundary, in 1883. From there tourists were transferred to stagecoaches for the last leg of the trip into the park, until a branch line was completed to the park in late 1883. Between 1883 and the early 20th century, the Northern Pacific built roads, hotels, and other visitor facilities in Yellowstone to accommodate burgeoning visitation. By 1910, the Northern Pacific had invested a million dollars in developing Yellowstone's tourist infrastructure and promoted its investments by marketing the route as its "Yellowstone Park Line" (Sellars 1997:20).

The Northern Pacific's charter forbade operation of subsidiary businesses, so it acted in Yellowstone National Park through independent companies. Though never directly owning any companies operating in Yellowstone, the Northern Pacific ensured tourist development was handled independently by men loyal to Northern Pacific interests and backed creation of a variety of companies, such as the Yellowstone Park Association (YPA), which operated hotels, constructed roads, and controlled transportation within the park (Haines 1996b:42–53).

The idea of launching a passenger boat on Yellowstone Lake to service the growing tourist trade was mentioned several times in the 1880s. As early as 1880, P. W. Norris observed that Yellowstone Lake, though very dangerous for sailing craft,

> . . .even a small steamer, well built and managed. . .would be [in] little danger attending regular trips around the fingers, thumb and palm of the lake. . . . [W]ith a suitable steamer making regular excursions. . . it is safe to predict that a hotel on some one of the many charming terraces near the foot of the lake would ultimately prove a profitable investment in this region of wonders (Norris 1880:12–13).

In 1889, park administration granted a permit to the Yellowstone Park Association for a naphtha launch on Yellowstone Lake, but the plan was never executed (Harris 1889:5). In the same year, the Yellowstone Park Association Board of Directors voted to put a steamboat, to be operated by Ella C. Waters, on the lake under the company's franchise (Haines 1996b:18).

The Steamer *Zillah*

Ella (or Eli) C. Waters is probably the name most closely associated with maritime activities on Yellowstone Lake. Born in 1849 in New York, Waters spent his early years in Fond du Lac, Wisconsin. When 14, he enlisted in the Union Army and received praise from his commanding officer for bravery in Civil War action. On July 26, 1865, he mustered out of service and began a series of endeavors that eventually led him to Yellowstone, including stints as a gold prospector, tea merchant, hotel operator, cattleman, and representative in the Montana Territorial Legislature. By the mid-1880s, after watching his fortunes rise and fall several times, he found himself in Yellowstone country. In 1887, he was appointed general manager of the Yellowstone Park Association (Yellowstone Park Company 1995).

In the summer of 1889, the Yellowstone Park Association acquired a steel-hulled, 40-ton steamer to provide tourist transportation on Yellowstone Lake (Figs. 2.3–2.6). The steamer *Zillah*, 25 m (81 ft) long with a 4.2-m (14-ft) beam, was

brought from Michigan to Yellowstone in segments (Haines 1996b:18–19). The vessel was originally launched on the Great Lakes in 1884, and had sunk in Lake Michigan, but was raised before its disassembly and trip west (Haines 1996b:401 n53). *Zillah* was working on Lake Minnetonka in eastern Minnesota when purchased by Charles Gibson, owner of Yellowstone Park Association (Bartlett 1989:190–191). During the winter of 1889–1890, a crew reassembled and fitted-out the vessel. The "Certificate of Inspection of the *Zillah*," from the firm of Douglas and Douglas dated September 5, 1906, notes the steamer was built in Dubuque, Iowa, in 1884, could carry up to 120 passengers, and had onboard six or seven officers and

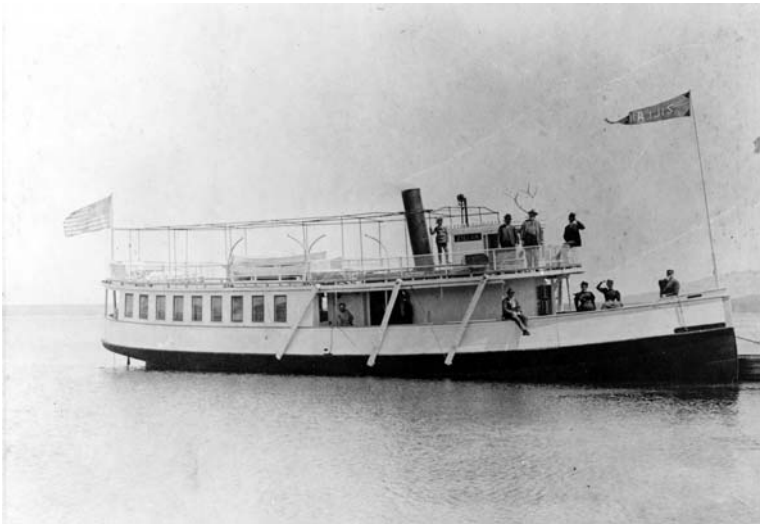

Fig. 2.3 *Zillah*, possibly at West Thumb, after 1889 (Yellowstone NP Archives)

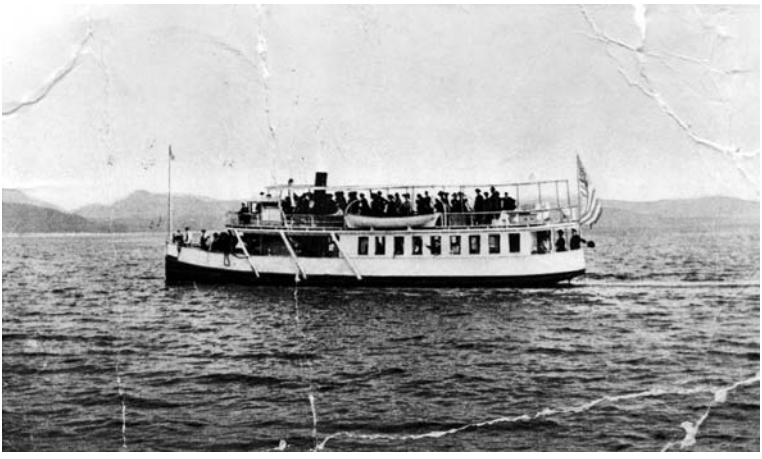

Fig. 2.4 *Zillah*, about 1896 (Yellowstone NP Archives)

Fig. 2.5 *Zillah* at Lake dock, 1896 (Yellowstone NP Archives)

Fig. 2.6 *Zillah* at Lake dock, 1896 (Yellowstone NP Archives)

crew (Bartlett 1989:207). Haines (1996b:18–19) suggests *Zillah* was on Yellowstone Lake by 1890, but the 1891 Superintendent's Report indicates the boat was actually licensed a year later:

> The proposition to put a small steamer on the lake for the accommodation of tourists has been agitated for a good many years, but was only recently accomplished. Early in July, an inspector came and gave the boat a license to carry 125 passengers. It is a smooth-running, seaworthy little vessel and will add much to the attractiveness of the lake as a resort. I hope to see it made a part of the Park transportation, and used in ferrying tourists from the Lake Hotel to the West Thumb in their journey around the circuit (Anderson 1891:7–8).

Captained by E. C. Waters, *Zillah* provided an alternative to the laborious stagecoach that brought tourists through the park to the Lake Hotel. Because Waters was not in business with the coach transportation companies, he charged an additional fee for lake transportation. Many tourists complained to the superintendent about Waters' extra fee. Despite this and other questionable acts, however, Waters received favorable comments in the park annual reports. For example, Acting Superintendent Anderson's 1892 report states:

> The steamer on the lake has been running successfully for a year or more, and adds much to the pleasure of a trip through the park. It is commodious and comfortable, and I believe perfectly safe. It is now made a part of the park transportation, and carries passengers, at their option, from the Thumb to the Lake Hotel, thus relieving them of 18 miles of tedious staging. I believe the boat company has enough small boats for the demands of fishing parties, but I think prices might be lowered where boats are used continuously for several hours (Anderson 1892:7).

Similarly, Anderson noted in his 1893 report that "[t]he steamer continues to be satisfactorily run, and is greatly enjoyed by all tourists who make the trip on it" (Anderson 1893:10). However, labor problems affected lake business in 1894. Because of close association between Yellowstone tourism and the railroad companies, the 1894 railroad strike resulted in losses to all park operations. Superintendent Anderson commented in his Annual Report:

> The boat company has suffered quite as much as other industries in the Park from lack of patronage. The boat has been put in excellent condition, and it furnishes one of the most delightful bits of travel on the tour. The proposition to put a few small steam or naphtha launches on the lake has not been carried out, but I believe it would prove remunerative and certainly would be a great accommodation to tourists (Anderson 1894:8).

By the following year, business returned to normal. E. C. Waters obtained a large percentage of the tourist travel and, as company general manager, he was granted a license to expand his business to include selling small groceries, providing blacksmithing to campers, and taking parties on small side trips, a niche not filled by larger concessionaires (Anderson 1895:10). He also expanded his business to include renting small boats and fishing tackle to tourists. In 1896, Waters placed bison and elk on Dot Island as an added attraction to *Zillah* customers, a move that contributed to his eventual undoing in the park.

Waters received permission to construct small landings at several points on the lake shore, including Dot Island and at his operations center near the Lake Hotel (Anderson 1896:10). Satisfactory reports of the boat operation continued through the remainder of the decade and into the early years of the 20th century. *Zillah*

was popular with tourists, and it carried 2,589 passengers during the 1897 season (Young 1897:6) and 3,050 in 1900 (Goode 1900:4). At the turn of the century, the strong Yellowstone Lake tourist business prompted acting superintendent Pitcher (1901:7) to suggest it would be desirable that "some competition be introduced in this business." The following year Pitcher (1902:12) suggested a larger boat, or several smaller ones, should be placed on the lake to accommodate increased tourist traffic.

Within a few years, E. C. Waters, likely in an effort to thwart competition, followed Pitcher's suggestion of a larger boat. In the meantime, however, the first few years of the new century continued to be successful for Waters. *Zillah* carried 3,826 passengers in 1904 (Pitcher 1904:10) and a record 5,275 passengers in 1907 (Young 1907:10). Despite these successes, Waters' Yellowstone Lake Boat Company fell into financial trouble, in part due to "his unscrupulous activities" (Haines 1996b:50). Because tourists' complaints continued about the "exorbitant" $3.00 charge for passage, Pitcher pushed his suggestion for increased competition in the lake excursion boat business, which may also have been fueled by *Zillah*'s deteriorating condition. As early as 1902, *Zillah*'s declining condition was commented upon by one traveler who, when seeing the moored vessel, said "[i]t was such an old rattletrap that I would not risk passage on it" (Bartlett 1989:192). E. C. Waters, in an apparent effort to shore up his operation, acquired a new larger vessel in 1905. By this time, *Zillah* had deteriorated beyond repair, and its tour boat career had ended. The vessel was either sold for scrap or scuttled sometime after 1920 (Yellowstone Park Company 1995:6).

The Steamer E. C. WATERS

Increasing tourist trade after the turn of the century and comments by park management suggesting competition prompted E. C. Waters to expand his tour boat operations. As president of the Tacoma-based Pacific Launch Company, Waters brought plans and materials for a 43 m (140 ft) × 9 m (30 ft) wooden-hulled steamship to Yellowstone Lake in 1904 (Yellowstone Park Company 1995:6). The new vessel was constructed and launched on the marine railway at the Lake docks boathouse in 1905 at a total cost of $60,000 (Yellowstone Park Company 1995:7). The new steamer, larger than *Zillah*, was christened *E. C. Waters* after its owner and captain, and was expected to carry Waters' business into the next decade.

E. C. Waters was 38 m (125 ft) in length and 8 m (26 ft) in beam and was the largest Yellowstone Lake passenger steamer; it was designed to carry 500 passengers (Haines 1996b:127) (Fig. 2.7). After launching the vessel, Waters requested a permit to carry the full complement of passengers, but park administration refused it. Because of difficulties with the park, Waters never made more than test runs with his new steamer (Whittlesey 1988:167). He refused to agree to a permit to carry fewer than 500 passengers, so the new steamer sat idle at its Stevenson Island anchorage (Haines 1996b:127).

Because of disagreements with park administration over the 500-passenger *E. C. Waters* permit and other problems he created through the years, Waters was asked to leave the park in 1907 (Haines 1996b:77). After Waters left the park, the T. E.

Fig. 2.7 Postcard photograph of *E. C. Waters* at Lake dock, about 1905 (Yellowstone NP Archives photo no. 14871)

Hofer Boat Company was given a permit to operate Yellowstone Lake concessions, and they bought Waters' park assets in 1910. T. E. Hofer Boat Company was reorganized into the Yellowstone Park Boat Company in 1911 with Harry Child as director (Bartlett 1989:193). *E. C. Waters* remained secured in a cove on Stevenson Island's east side, where it was thought to be safe from winter ice. During a strong easterly wind in 1921, however, the ice pushed the steamer onto the beach, where it still remains (Haines 1996b:415 n67).

The shipwreck was the subject of salvage operations in 1926, when the engine and boiler were recovered (Haines 1996b:415 n67). After removal of *E. C. Waters'* machinery, the Scotch marine boiler was used to heat the Lake Hotel for 46 years (Aubrey Haines, 1996, personal communication). The boiler was converted from wood to oil in 1937 and later coated with asbestos insulation (Dittl and Mallman 1987:19). In 1972, it was sold as scrap to a junkyard near Three Forks, Montana (Aubrey Haines, 1996, personal communication). Original steam gauges from *E. C. Waters* are reportedly still in use in the hotel heating system (John Lounsbury 1996, personal communication). There is no record of what became of the vessel's engine. The steamer's anchor was taken to the Bridge Bay marina, where it serves as a signpost (Fig. 2.8).

After the machinery was removed from *E. C. Waters*, the vessel quickly began to deteriorate. It served various informal purposes over the years: as a winter shelter for cross-country skiers, a "prop Jack Croney's fish-fry business," and a "retreat for brawls fueled with moonshine" (Haines 1996b:316). After years as an eyesore, however, park rangers eventually took it upon themselves to clean it up. In the spring of 1930, a small group of rangers skied across the lake to Stevenson Island and

Fig. 2.8 *E. C. Waters*' anchor at Lake dock in 1961 (photo by A. L. Haines, Yellowstone NP Archives)

burned the ship to waterline (Haines 1996b:316). Today, only *E. C. Waters*' hull bottom remains.

1910–1950

After the Yellowstone Park Boat Company (formerly Hofer Boat Company) transition from E. C. Waters' Yellowstone Lake Boat Company, little information is available about the lake tour business. Visitation apparently remained fairly constant, as records show from 1912–1915 passengers ranged from 3,305 to 4,277 per season (Brett 1912:7, 1913:4, 1914:6, 1915:6), similar to E. C. Waters' business during the late 1890s. The new company operated a small steamer called *Jean D* (Figs. 2.9–2.12), a boat similar to *Zillah*, although fishing boat rentals (Figs. 2.13 and 2.14) and tackles sales were more profitable (Bartlett 1989:193).

Fig. 2.9 *Jean D*, about 1910 (Yellowstone NP Archives photo no. 36373-3)

Fig. 2.10 *Jean D*, about 1912 (Yellowstone NP Archives photo no. 36362)

Fig. 2.11 *Jean D*, about 1910 (Yellowstone NP Archives photo no. 36373-3)

Fig. 2.12 *Jean D* (*left*) and *Zillah* (*right*) on shore at Lake, about 1922 (Yellowstone NP Archives photo no. 36372-1)

Fig. 2.13 Rental boats at Lake (Yellowstone NP Archives photo no. 18771)

Fig. 2.14 Passenger launch at Lake in September 1934 (Yellowstone NP Archives photo no. 29091/12120)

In 1916, passenger numbers dropped to 2,558 (Yellowstone National Park 1916:3). A prophetic note in the superintendent's 1917 Annual Report provides a clue for Yellowstone Lake passenger decline – touring cars had supplanted the old stagecoach for park travel (Yellowstone National Park 1917:6). More visitors were using their own car to visit the park. Auto camping became especially popular after World War I, as indicated by a comment in the superintendent's 1918 Annual Report:

> The Yellowstone Park Boat Co. rendered little service to the public this season. This company has very little useful boat equipment. Its big boats are in poor condition and will not meet present demands on service on the lake, and its small boats, except two (14 m) 45-foot gasoline boats and a few launches, are old, dilapidated, and unsafe. This company has not furnished satisfactory equipment for the boat service since 1916 (Yellowstone National Park 1918:81).

Park archival photographs depict several small watercrafts operating on Yellowstone Lake during 1910–1930 (Figs. 2.15 and 2.16), but no supplemental information was found during this project's limited search in these archives. The photographs include: a US Fish and Wildlife Service boat (Fig. 2.17) from around 1910; what appears to be an NPS speedboat (Figs. 2.18 and 2.19) dating to the 1920s; and another NPS boat named *Marion*. Several commercial speedboats operated on the lake in the 1920s. One, *Adelaide* (Fig. 2.20), was used between West Thumb and the Lake Hotel, and may be a boat added to the lake fleet in 1922 to carry 11 passengers. It was propelled by a 185 hp Sterling engine at speeds of 55–65 kmph (35–40 mph) (Yellowstone Park Company 1976:5).

Fig. 2.15 Gas-powered launches at West Thumb (Yellowstone NP Archives photo no. 43549)

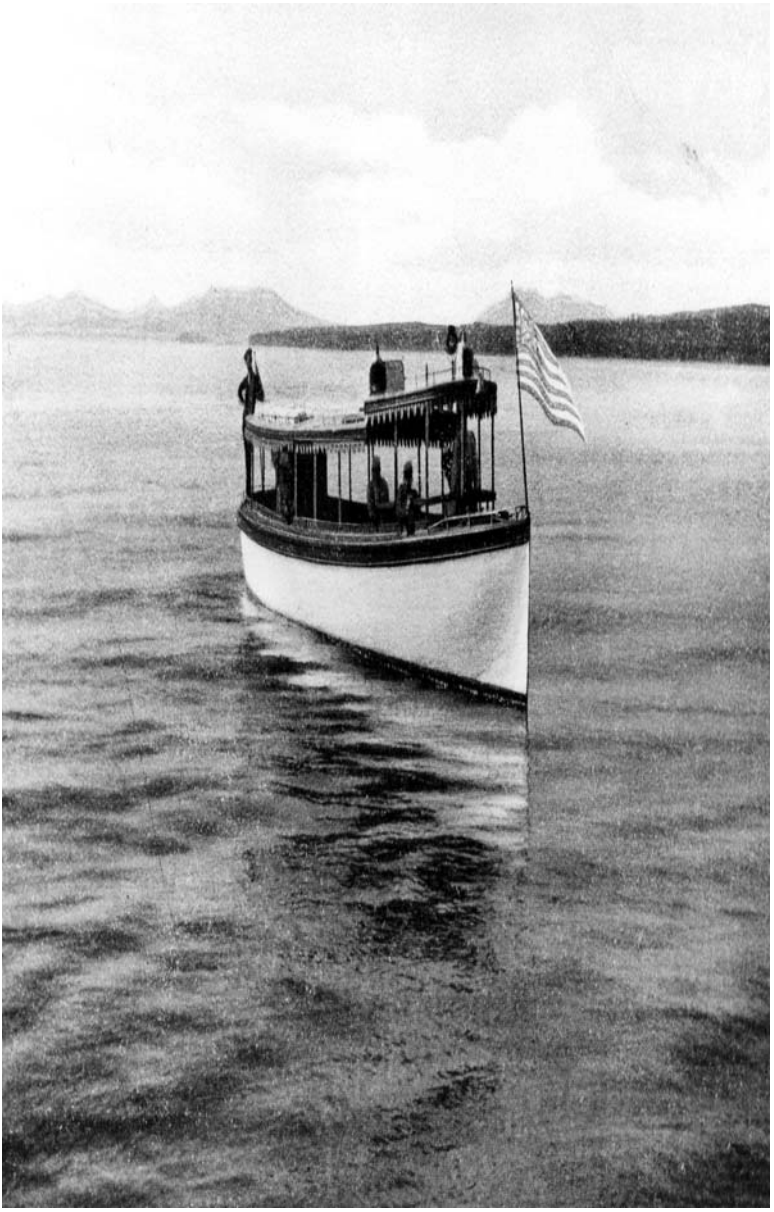

Fig. 2.16 Gas-powered launch at West Thumb (Yellowstone NP Archives photo no. 43575)

The NPS purchased an 8.5-m (28-ft) Chris Craft in 1930 for lake service (Fig. 2.21), and the Bureau of Fisheries operated several boats in 1930–1931. In 1936, the Department of the Interior provided three lake boats to the NPS: two cabin cruisers (Figs. 2.22 and 2.23) and a Coast Guard boat (Figs. 2.24 and 2.25).

Fig. 2.17 US Fisheries vessel, 1930s (Yellowstone NP Archives photo no. 9254-6)

Fig. 2.18 NPS speedboat (runabout) at Lake dock, about 1915 (Yellowstone NP Archives photo no. 29038/12004)

Fig. 2.19 NPS speedboat (runabout), October 1938 (Yellowstone NP Archives photo no. 29069/12069)

Fig. 2.20 Eleven-passenger speedboat (runabout) *Adelaide* postcard during the 1920s (Yellowstone NP Archives photo no. 87423)

Fig. 2.21 NPS 28-foot Chris Craft, 1930s (Yellowstone NP Archives photo no. 29079-4)

Fig. 2.22 Deckhouse cruiser National Park Service No. 2 at Lake dock, 1938 (Yellowstone NP Archives photo no. 29055-2/12044)

Fig. 2.23 Deckhouse cruiser National Park Service No. 1 on Yellowstone Lake (Yellowstone NP Archives photo no. 29077/12077)

Fig. 2.24 Former US Coast Gurad lifeboat *Arena Cove* at Lake, 1936 (Yellowstone NP Archives photo no. 29046-1/12016)

These boats were brought to Gardiner, Wyoming, by rail and trucked to the Lake Hotel dock boathouse, where they were reconditioned and launched as NPS Boats 1, 2, and 3. These boats were used into the 1940s and 1950s. Another NPS boat,

Fig. 2.25 *Arena Cove* being launched at Lake boathouse, 1936 (Yellowstone NP Archives photo no. 29044-3/12012)

named *Lollipop*, is reported sunk in the lake in 1940 (Dan Lenihan, 1996, personal communication). No additional information on *Lollipop* was located.

Yellowstone Lake has a rich navigation history, and many watercrafts undoubtedly remain underwater. So far, no indigenous watercraft have been located, but it is possible that submerged remains may be preserved in the lake. Of the three tour boats more than 15.24 m (50 ft) in length that operated on Yellowstone Lake between 1890 and 1930, only *E. C. Waters*' remains have been documented archeologically. Concessionaires and government agencies both operated a variety of small crafts, including cabin cruisers; steam, naphtha, and gas-powered launches; and small Fisheries Bureau boats. According to archival sources, at least 25 watercrafts operated on Yellowstone Lake before 1950. Added to these are many non-motorized rental boats and canoes, which make an impressive material record of lake navigation history. The history of these watercrafts is incomplete, but it could easily compete with the park's history of stagecoach and motorcar as critical elements of Yellowstone's tourist infrastructure relating to transportation and recreation.

Previous Archeological Work

Archeologists have conducted a variety of investigations on Yellowstone National Park. The National Park Service's Midwest Archeological Center (MWAC) has references for about 221 documents relating to Yellowstone's archeological investigations, including trip reports, cultural resource management (CRM) investigations, and more traditional archeological survey, inventory, evaluation, and excavation studies. National Register of Historic Places documentation, post-fire

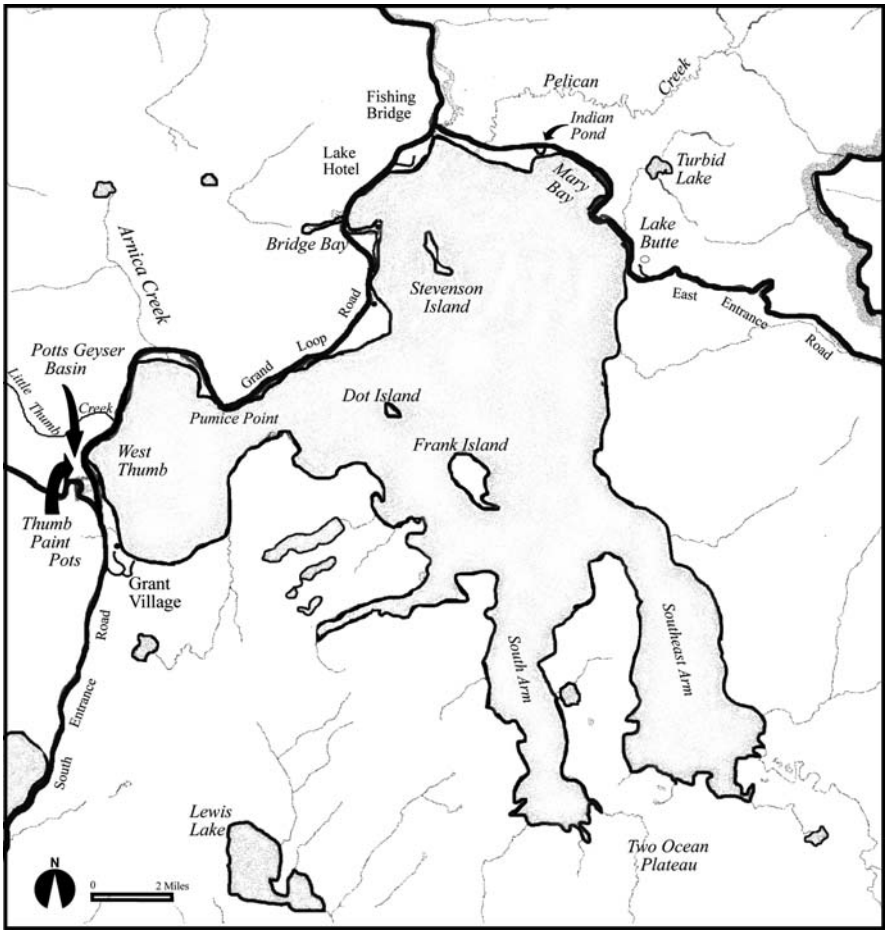

Fig. 2.26 Yellowstone Lake

surveys, and park development projects produced many of these archeological investigations. Most park archeology has focused on prehistoric sites; however, there has been a good deal of work on sites related to early park history. Some archeological work around the lake has been focused on the park's tourist infrastructure. About 30 archeological studies have been done near Yellowstone Lake, most on the north and west shores (Fig. 2.26).

Fishing Bridge/Mary Bay

The Mary Bay north shore, just east of Pelican Creek between Indian Pond and Yellowstone Lake, is noted for its evidence of human activity. As early as 1880,

observers described this area as having "...abundant evidence of frequent occupancy by Sheepeater aborigines..." in the form of "...decaying brush corrals, wickiups, and lodge-poles ... [as well as] rude stone heaps of wickiup sweathouses" (Norris 1880:587).

One of the park's largest and oldest sites, 48YE1, is located at Fishing Bridge between the lake outlet (Yellowstone River) and Pelican Creek, covering nearly the entire peninsula. Work began on this site in the 1940s when two human burials, with associated grave goods and dogs, were removed from the area during construction activities (Condon 1948; Wright et al. 1982:2–26; Cannon 1993:15). Montana State University (now University of Montana) archeologists recorded the site and five others in the northern lake area during a 1960s park-wide inventory survey (Taylor et al. 1964). According to Cannon (1993:7–9), lack of diagnostic artifacts prevented the Montana survey crew from determining site age. However, related components and Reeve's (1989) later work indicate 48YE1 may have been occupied from the Paleo-Indian period (about 7,000 B.C.E.) to Late Prehistoric times. Reeve (1989), who recovered 8,560 flaked stone, ground stone, bone, and shell artifacts along with fire-cracked rock, concluded native subsistence may have centered on fishing. Work on other sites in the area has been conducted by Cannon (1991), including a site dating to 5,000 B.C.E. on Mary Bay's south shore. Historical activity has also centered on Fishing Bridge. Recent evidence supports this location as one of Hayden's 1872 expedition campsites (Cannon 1995:40). Other work in the immediate area, conducted ahead of road development or facility improvements, includes that of Williams and Wright (1980), Baumann (1984), Cannon (1990, 1992, 1995) and Connor (1994).

Three NPS-related sites have been reported in the Lake Butte area south of Mary Bay (Hunt 1989:3–4, 21–22). Because the Fishing Bridge/Mary Bay area was a primary camping place for both European American expeditions and American Indian groups traveling through the area, there may be many more significant sites in this area. Historical documentation supports this possibility. Haines (1996a:50–52) cites several references to the lake outlet/Pelican Creek/Mary Bay vicinity as a camping area for trappers as early as 1836, when a two-day battle between a 40-person trapping party and Piegans occurred near Indian Pond (Haines 1996a:52). Five prospecting parties camped in this vicinity from 1864–1867 (Haines 1996a:68–69, 75, 79), and later exploring expeditions made the area a regular camping place between 1869 and 1871 (Haines 1996a:110). A large Nez Perce squaw camp was located at Indian Pond in 1877 (Haines 1996a:227).

Lake/Bridge Bay

The area between the lake outlet at the Yellowstone River and Bridge Bay is the most extensively developed part of the lake shore (Fig. 2.26). Several archeological projects have been conducted in this area resulting in few indigenous sites being located, but several European American sites, related mostly to hotel and park activ-

ities, being recorded. With one notable exception, native sites along this shoreline tend to be small and contain limited materials. The exception is a large site located just northeast of Bridge Bay, with a purported fish weir located just offshore. Reports of numerous artifacts encountered during road construction through this site attests to its size. Haynes (1946:104) noted: "In building the road along the lake, the workmen found many arrowheads, spearheads, skinning knives and other Indian artifacts." Johnson (1986, 1989b), Daron (1992a, 1992b, 1992c, 1992d, 1995), Cannon and Phillips (1993a), and Cannon (1995) have conducted development-related surveys and archeological testing projects in the Lake/Bridge Bay area.

Hunt (1989) recorded 11 European American sites between Lake Junction and Bridge Bay, including some associated with road construction, NPS maintenance activities, hotel trash dumps, and, on Stevenson Island, the exposed *E. C. Waters* shipwreck. Johnson and Lippencott (1989:31) first recorded the wreck remains as an archeological site (48YE13) during their post-fire assessment work. Other underwater sites are also present in the area, particularly features related to the Lake Hotel, Lake boathouse and dock, and the former fish hatchery.

West Thumb

West Thumb (Fig. 2.26) history is similar to that of Lake Village. Archeologists from Montana State University recorded the first 12 archeological sites along the West Thumb shoreline in 1958–1959 (Taylor et al. 1964). Most sites range from Grant Village on the west shore to Arnica Creek on West Thumb's north shore. These sites date from Paleo-Indian period (about 8,000 B.C.E.) to Late Prehistoric (Taylor et al. 1964:108, 179). In 1980, Samuelson (1981) discovered two more sites, which she concluded represent winter hunting and spring fishing activities. Little work was done in this area until 1992 when MWAC archeologists surveyed and tested several sites between Arnica Creek and Little Thumb Creek near the Potts Geyser Basin north of West Thumb (Cannon 1993). Archeological testing exposed hearths on an old occupation surface. Researchers also recovered sherds from 48YE449 – the only site to yield such artifacts in the park. Some older sites, deeply buried and dating back to 5,000 years, provide important information on indigenous lakeshore use relative to changing lake levels through time. Most sites in this area, like the Lake, are small with few stone artifacts. Johnson (1989b), Daron (1992e), Cannon (1992), Cannon and Phillips (1993a), Deaver (1993) and Johnson et al. (1993) have all conducted archeological investigations here as a result of park improvements in Grant Village and Potts Geyser Basin.

West Thumb, protected from prevailing winds, was apparently heavily utilized and likely contains many more indigenous sites. This area was also the center for much European American activity in the park. In 1839, trapper Osborne Russell camped at West Thumb Geyser Basin as did George Huston in 1866 (Haines 1996a:49, 72), and probably several unrecorded prospectors during the 1860s. Most later expeditions camped at the Geyser Basin: the 1869 Cook-Folsom party; the

1870 Washburn expedition; the 1871 Hayden expedition (twice along with his military escort); the 1873 military reconnaissance by Lt. Jones' troops; and Lt. Doane's winter expedition of 1876 (Haines 1996a:99, 125, 127, 148, 203, 210–211).

By 1879, there was a rough trail from the Upper Geyser Basin to West Thumb and, in 1882, General Sheridan cut a rough road from the park's south entrance to West Thumb (Haines 1996a:245, 263). The Upper Geyser Basin road to West Thumb was improved and opened to the public in 1892 (Haines 1996b:217–219), leading to increased visitation, which, in turn, led to development of army (and later NPS) visitor facilities. With the road's opening and its extension to Lake, tourists were rerouted through West Thumb as they passed through the park. As a result, many structures have been built, removed, and maintained near the geysers, all contributing to the archeological record of the West Thumb Geyser Basin. Of particular interest to this study, the West Thumb area was a terminus for the passenger steamer *Zillah* between 1891 and 1907, which had its dock near the Thumb Paint Pots.

Southeast Arm

Very little archeological work has been conducted along Yellowstone Lake's Southeast Arm (Fig. 2.26). However, three archeological sites were briefly visited during this study. One of two sites reported in the vicinity of the south shore patrol cabin were located. The "YCC Camp Site" was not relocated. A site on shoreline due south of Molly Island was located, but not formally recorded. Site 48YE707 on Terrace Point on the arm's east shore was briefly visited. This site consists of several lean-tos and was first recorded in 1989 by Cannon (1993:48–49, 140–141).

1995 SRC Reconnaissance

In August 1995, after discussions with park management, the SRC staff spent nine days in the park conducting reconnaissance-level underwater investigations at several Yellowstone Lake locations (Lenihan 1995a, 1995b).

The 1995 SRC Yellowstone Lake investigation was initiated, in part, by the impending visit of a large group of scuba divers. Later, a scuba diving club asked permission to conduct a geophysical survey to locate *Zillah*, purported to have been scuttled in deep water offshore the Lake Hotel. Park management became concerned about the potential impact to underwater archeological sites from large dive groups, and they requested advice from SRC about the park's response to the dive club survey request. The 1995 SRC investigations included dives in particular areas to determine site location, character, integrity, and archeological significance. Investigations were conducted at the Lake Hotel dock area, West Thumb Geyser Basin, and *E. C. Waters* site on Stevenson Island. Dives were made at other locations to document some of the park's natural underwater features. Recommendations by Lenihan (1995a:9–10) led to the subsequent work in 1996, as reported in this chapter.

Although much archeological research was conducted around Yellowstone Lake, the 1995–1996 SRC investigations were the first time submerged cultural resources were intensively investigated in the lake. These unique vestiges of Yellowstone's underwater cultural heritage, especially related to past tourism, are discussed in the next section.

Yellowstone Lake Archeological Survey

Yellowstone Lake maritime history and the unique maritime infrastructure that developed there is the direct result of two 19th-century cultural processes: industrial capitalist expansion, in the form of the westward spread of railroads, and the rise of Western tourism. These two processes are directly linked and together shaped the material remains found in Yellowstone Lake today. Through its connection to westward rail expansion and tourist development, Yellowstone Lake's passenger steamer trade and other elements of its maritime infrastructure are linked to the larger capitalist world-system. As a subset of this larger system, related maritime elements on Yellowstone Lake can be called a "maritime system."

Yellowstone Lake Maritime System

The maritime system concept embodies a modified world-system perspective, where a maritime system is a subset of the larger capitalist world-system, a concept borrowed from Wallerstein (1974, 1979, 1980, 1989). According to Orser (1996:83) the ". . .hallmark of the world-system perspective is that since the sixteenth century, a single capitalist world-economy has been the driving force behind the creation of the modern world. The modern world is characterized by a single economy that is colonial, international, and expanding." Although models based on Wallerstein's world system theory are no longer fashionable in contemporary sociocultural anthropology, and have been severely critiqued in archeology (Rogers 2005:335), as an influential model for the spread of capitalism, they nonetheless have had a significant impact on historical archeology.

Wallerstein's original framework outlined expansion of the European capitalist system from the 16th to the 19th century, focusing specifically on a worldwide division of labor and on economic relationships between developed (core) and developing (peripheral and semi-peripheral) states. Initial use of world systems models in archeology was partly a reaction against processual, neo-evolutionary frameworks that stressed environmental adaptation over social interaction and exchange. As postprocessual approaches became more widespread, researchers sought new theoretical perspectives that acknowledged historical contingencies rather than seeking cross-cultural and cross-temporal generalizations (Champion 1989; Kohl 1989; McGuire 1989). In addition to the overall historical perspective world systems approaches bring to archeology, part of their heuristic value is to reinforce the idea

that societies (or elements within societies) are interconnected and cannot be evaluated in isolation (Rowlands 1987). A world systems framework also accommodates a hierarchical, multiscalar approach and allows a diachronic view as interregional relationships change over time (Champion 1989; Rice 1998).

Despite some advantages offered by a world systems perspective in historical and maritime archeology, a number of critiques severely limit its uncritical application. First, many researchers suggest world systems models deny local agency by assuming that the core is active and the periphery is a passive recipient of innovation and change, as well as assuming a fundamental power asymmetry with the core politically dominating the periphery (McGuire 1989; Lightfoot and Martinez 1995; Dietler 1998, 2005; Rice 1998; Schortman and Urban 1998; Stein 1998). A second, but related, critique is that local and regional variability is ignored in a world systems perspective, which suggests that the core always controls exchange (Dietler 1998; Rice 1998; Stein 1998) and outcomes of intersocietal interactions are determined by each society's position within a broader interregional exchange network (Schortman and Urban 1998:105). The heuristic value of world systems models in some cases is diminished if its application inadvertently obscures past socioeconomic relations by essentializing groups as either core or periphery (Rice 1998; Schortman and Urban 1998; Dietler 1989:127; see also Dietler 2005) or assuming a priori relationships based on economic inequality.

Despite widespread criticism of world-systems theory in general, however, most contemporary researchers acknowledge that local archeological cases can only be understood fully when placed within a broader regional context. Agency and individual action are constrained by larger structural forces, often economic, and it is this interplay between structure and agency that researchers must balance (Champion 1989; Lightfoot and Martinez 1995; Dietler 1998). For example, while Sahlins recognizes the theoretical and analytical value of structures and world systems as long-term undercurrents that powerfully influence people's lives, he suggests they are not deterministic. These structures are in turn shaped and transformed by historically situated events (Sahlins 1981:111).

In its relation to the capitalist world-system, Yellowstone Lake maritime system archeology can also be compared to the archeology of mining frontiers. Hardesty (1988:1) writes, "...mining colonies were financed, manned, and supplied from the urban centers of America and Europe. Despite their geographical remoteness and small size, the colonies were linked into a vast transportation, communications, demographic, and economic network on a national and international scale." Even a seemingly isolated example as the maritime tourist infrastructure on Yellowstone Lake has direct ties to the network created by the capitalist world-system, under the influence of the American railroads. In approaching this type of study, Orser (1994:5) writes "...archeologists conducting research at sites associated in any way with the modern world ... must attempt to frame their studies in the broadest possible terms." The maritime material record in Yellowstone Lake is most successfully understood when placed in this larger historical and cultural context.

The maritime system is a way of conceptualizing the integrated maritime activities of a particular region (large or small) or time period, and their relationship

to the larger capitalist world-system. A maritime system incorporates all related aspects of a maritime world, from ships, shipyards, waterfronts, custom houses, outfitters, cargo, and trade goods; to insurance companies, classification rules, and salvage industry; and the material record these activities produced. This idea is similar in concept to the regional approach used in maritime archeology (Murphy and Saltus 1981; Lenihan 1987; Murphy 1993; Conlin 1994; Kenderdine 1994; Staniforth 1997; Murphy 1997), which is a methodology that looks at wide areas and on the interconnections of shipwrecks in a region, instead of focusing solely on individual shipwrecks as isolated "accidental" events. The concept is also related to the cultural landscape or "maritime landscape" concept that has been growing in popularity in recent years (Westerdahl 1992; Bannerman and Jones 1999; Esser 1999; McCarthy 1999). A maritime landscape is one of the material manifestations of a maritime system. The maritime system approach provides a method to address a wide context that focuses on the systemic behavior responsible for the material record. This analytical approach is particularly fruitful in using the archeological record to compare and contrast behavior among different maritime systems, for example between contemporary maritime systems or even temporally distant systems.

Maritime systems-oriented research may address the material remains produced by the system, which are removed from the cultural context and enter an archeological context, or which were salvaged and recycled but still retain their connection to the maritime system (for example, *E. C. Waters*' boiler used to heat the Lake Hotel). Orser (1996:116) and Staniforth (1996) have both discussed the "recontextualization" of artifacts in this way. This approach is similar to Hardesty's (1988) "feature systems," a concept that groups related, though sometimes physically disparate, features associated with Western mining sites. Industrial mining processes left material remains and activity areas that are directly related, though sometimes miles apart. Each feature cannot be successfully understood in isolation, but must be viewed as separate pieces of an integrated whole (Hardesty 1988:9–11), in this case, the maritime system.

Yellowstone Lake provides a useful focus for discussing the maritime system approach because it is isolated, limited spatially to Yellowstone Lake, and limited temporally to the late 19th and early 20th centuries. It is also uniquely limited in scope to one specific trade, tourism, which allows easier analysis than more complicated systems. Tourism also ties the maritime sites in Yellowstone Lake to other historical sites in the park, such as early hotel remains (Corbin et al. 2003). The Yellowstone Lake maritime system is a localized, specialized phenomenon that developed in a particular cultural context (Western industrial expansion and tourism) and in a particular environment (isolated, high mountain lake). Complex social and economic processes at work across the country influenced and shaped development of tourist facilities in Yellowstone, including the passenger steamer trade. Because the Yellowstone Lake maritime system is linked to the larger system of late-19th-century tourism and industrial capitalist expansion in the United States, we expected a number of similarities with contemporary maritime systems. But because of Yellowstone's isolation and unique environmental conditions, we also expected to see

distinct differences in the material record of the Yellowstone Lake Maritime System compared to others. The archeological record present in Yellowstone Lake, therefore, should reflect both the homogeneity and variability of Yellowstone's unique maritime system when compared to other contemporary systems, such as the Great Lakes.

Archeological remains from the Yellowstone Lake maritime system include historic dock remains at West Thumb and the village of Lake, the Lake boathouse and marine railway, a small steam launch located underwater near the Lake Hotel, the *E. C. Waters* site on Stevenson Island, and at least four submerged small boats from the early-20th-century rental boat fleet. The most extensive and interesting aspect of the Yellowstone Lake Maritime System recorded was *E. C. Waters*, which is discussed in detail below. Results of our archeological investigations in Yellowstone Lake are outlined below by geographic area and major sites (Fig. 2.27).

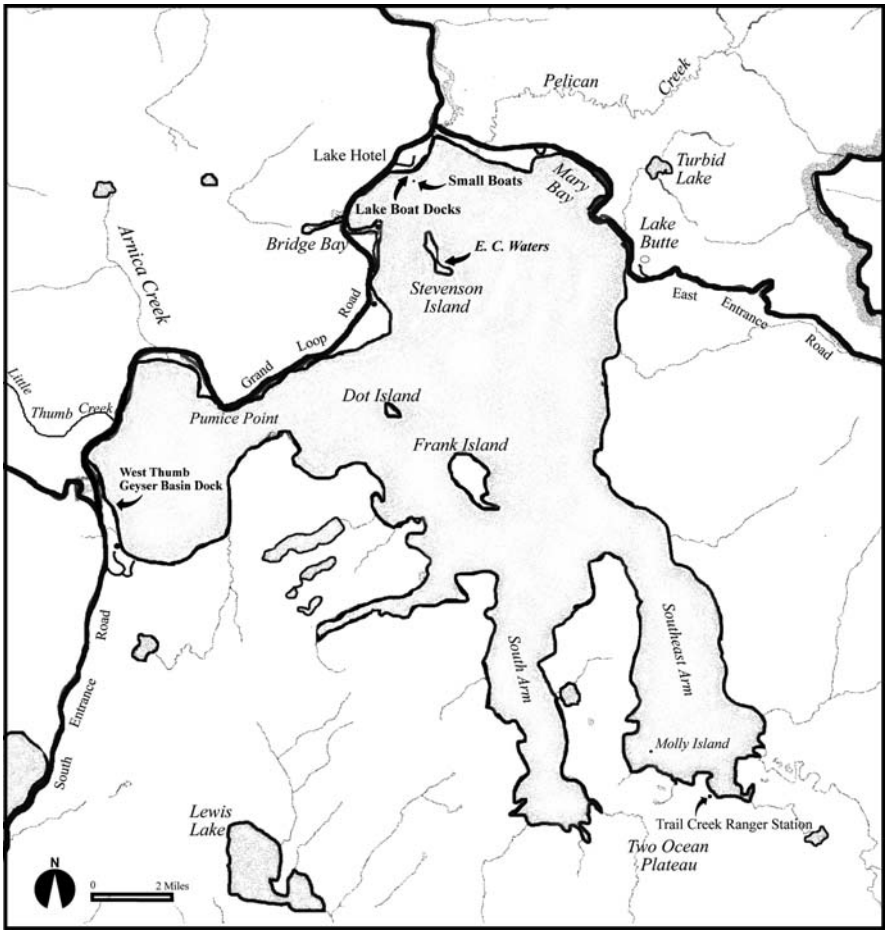

Fig. 2.27 Archeological sites representing remains of Yellowstone Lake's maritime system

Fig. 2.28 Algae-covered dock crib at West Thumb. NPS photo by Brett Seymour

West Thumb Geyser Basin

The focus of underwater investigation in West Thumb was an area east of the West Thumb Geyser Basin boardwalk, specifically the remains of the historical West Thumb crib-style dock. We documented the dock remains with scale drawings, videography and photography, and Differential Global Positioning System (DGPS) points to delineate the general dock outline and precisely position the cribbing. Water conditions here promote a thick growth of filamentous algae that covers the bottom (Fig. 2.28) making visual survey difficult. However, in addition to the historical dock remains, another curious find was a wagon wheel. The wheel (Fig. 2.29) is 1.4 m (4 ft 7 in.) in diameter, has tapered spokes and a metal tire 5.71 cm (2.25-in.) wide $\times$ 0.32 cm (0.125-in.) thick. The rim is composed of two felloes with a metal wedge or shim inserted at one seam to increase the diameter and tighten the fit. Other than some natural deterioration from years in the lake, the wheel is in good condition and shows little damage or wear (Fig. 2.30). According to District Ranger John Lounsbury, an historical wagon aficionado, the wheel size and construction suggest a small stagecoach because it appears too big for a buggy and too small for a freight wagon. Park Archeologist Ann Johnson (1997, personal communication) confirmed the wheel diameter matches those of the smaller stagecoaches in the park vehicle collection. There were perhaps five park stagecoach lines, and each stagecoach had a distinct paint scheme, which may have been useful for determining an association for this wheel. Unfortunately, no paint remained on the wheel. As a possible *terminus ante quem*, the last horse-drawn lines operated in the 1916 season after which

Fig. 2.29 Wagon wheel at West Thumb. NPS photo by Brett Seymour

motorized tours were conducted (Chittenden 1924:344), which indicates this wheel is at least 80 years old.

The historical dock remains at West Thumb provide the link between Yellowstone Lake's maritime system and the broader tourist system in the park. Sinter deposits from the active geysers coat the lakeshore in this area and form an underwater shelf immediately offshore the thermal features. A high portion of the shelf extends above water line about 3.35 m (11 ft) west of the dock remains and was incorporated into the original dock (Fig. 2.31). The dock remains consist of basal portions of six log cribs set three to a side to form an L-shape. All six cribs, spaced a consistent 6.71 m (22 ft) apart, have spilled rock out all sides (Fig. 2.32). The east-west portion is a linear rock pile extending along the lake bottom for a distance of 26 m (85 ft); the top of the rocks varies in depth below the surface from 1 m (3 ft) to 2 m (7 ft), while the bottom of the rocks ranges in depth from 1.5 m (5 ft) to 3.5 m (12 ft). Cribs 1 and 2 are less intact than other cribs; their rocks have spilled out-

Fig. 2.30 Close-up of West Thumb wagon wheel. NPS photo by John Brooks

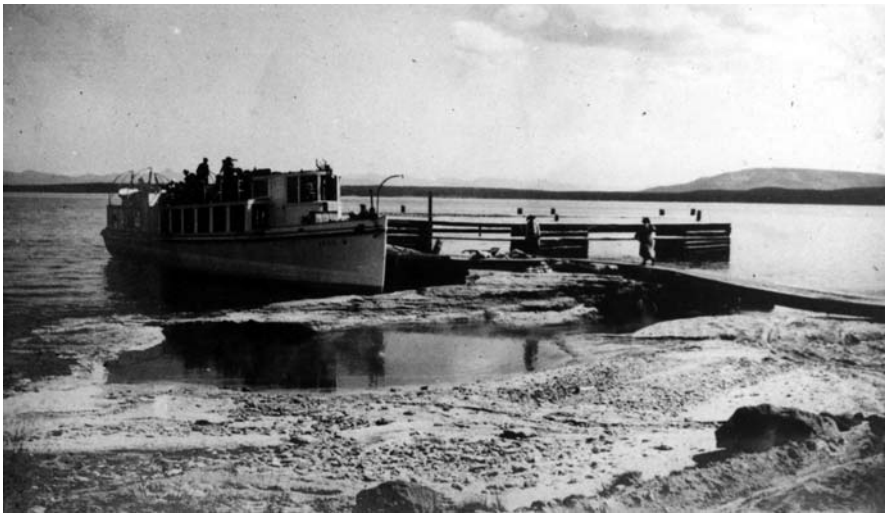

Fig. 2.31 *Jean D* docked at West Thumb. Note the cribbing and walkway (Yellowstone NP Archives photo no. 88438)

ward into mixed piles presenting the appearance of a jetty rather than discrete cribs. Numerous logs, cable, iron I-beams and a terra cotta pipe segment were observed in the rock piles. Crib 3, at the easternmost end of this dock section, is mostly intact and forms an acute angle; the alignment of cribs 4–6 extends about 35 m (115 ft) to the south. Cribs 4 and 5 have distinct crib remnants and less rock spillage to their

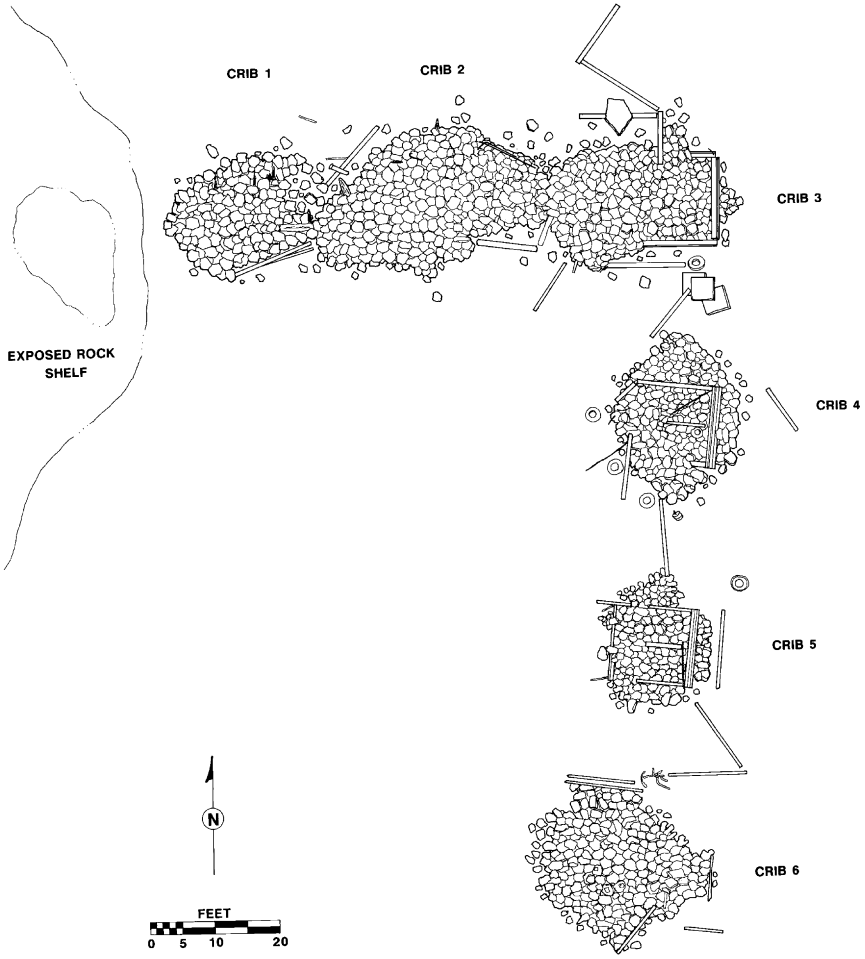

Fig. 2.32 Plan view site map of the West Thumb dock cribs. Drawing by Jim Bradford and Matt Russell

sides (see Figs. 2.32 and 2.33). Crib 6 is a distinct pile of rocks, but shows very little original crib form. Several automobile tires, crib logs, miscellaneous cable, and concrete slabs were observed between cribs 3 and 6. As depicted in Fig. 2.32, the crib alignment is not a true L-shape, but instead angles more to the west following the submerged shallow slope. One explanation for this alignment is that the builders were likely taking advantage of the shallow shelf slope edge, which reduced construction materials and allowed access to the deep water directly offshore.

The cribs are about 3.5 m (12 ft) on a side, with what appears to be an interior wall of logs dividing each crib into two parts. The cribs are made of logs ranging

Fig. 2.33 West Thumb dock crib. NPS photo by Brett Seymour

from 18 cm (7 in.) to 28 cm (11 in.) in diameter, with the majority about 20 cm (8 in.) in diameter. Almost solid algae growth and spilled rocks prevent complete documentation of the crib corners. Logs on all sides abut those above and below, creating a solid wall. The lower logs are shortened to accommodate the lake bottom slope, with those higher in the wall being the full 3.5 m (12 ft) in length or, in some cases, two logs with ends abutting to achieve the total length of a side. The crib corners are fastened with a single 2.5-cm (1-in.) iron or steel rod driven through the entire height of the crib side. The only evidence of overlap is in Crib 5, where the top course of logs has a single log overlap at each corner, with the corresponding next-side log abutting the overlap and tied at the next corner. This appears to leave a weak corner at the crib bottom, which might allow separation unless other fasteners were driven through the courses of logs at other locations. No evidence of fasteners other than at the corners was observed, nor were any horizontal ties (dogs) between logs. Algal growth may have obscured these detail features.

Crib 5 is a typical example and will be discussed in detail. The east wall is 2.1 m (7 ft) high, while the west wall, because of lake bed slope, is 1.2 m (4 ft) high. Two bent corner fasteners at the crib top have exposed lengths of about 2.6 m (8 ft 6 in.). Typical depth below surface at the crib tops is 1.8 m (6 ft). Subtracting the 1.8 m (6 ft) depth below surface from the 2.6 m (8.5 ft) exposed fastener length indicates the crib extended 0.7 m (2.5 ft) above water level. With the dock structure attached, the dock height above lake level would have been about 1 m (3 ft) (see Figs. 2.31 and

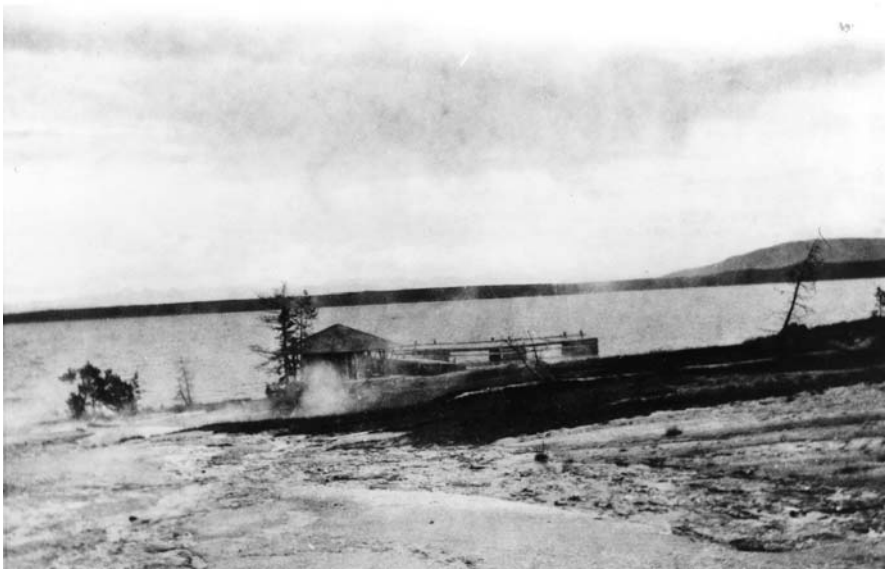

Fig. 2.34 West Thumb dock (Yellowstone NP Archives photo no. 94212)

2.34), sufficient to stay above lake ice in this protected area of the Thumb, which receives little ice shelving.

As shown in Fig. 2.31, the exposed shelf rock was used as a dock support. The original dock extended eastward from shore approximately 25 m (80 ft) to the exposed rock (with some small supports in very shallow water), incorporated the exposed rock as a support, then utilized cribs 2.5 cm (1 in.) and 5 cm (2 in.) about 1.5 m (5 ft) of water, and continued to the end of this segment at Crib 3 in about 3.7 m (12 ft) of water. Here the dock turned south, using cribs 4–6, for a distance of about 35 m (115 ft) to the end of the L. This configuration produced 3.7 m (12 ft) to 4 m (13 ft) of depth on the dock's offshore side at current lake level.

Crib dimensions indicate each would encase about 47 m^3 (1,656 ft^3) of rock fill to the lake surface, or about 51 m^3 (1,800 ft^3) to the bottom of the dock. The four north-south cribs (cribs 3–6) contained about 188 m^3 (6,624 ft^3) of rock. Cribs 1 and 2 contained about 61 m^3 (2,160 ft^3), which gives an estimated total dock fill volume of about 249 m^3 (8,784 ft^3), or about 297 m^3 (325 yd^3) of broken rock ranging from fist size to 0.3 m (1 ft) × 0.6 m (2 ft) × 0.6 m (2 ft). Rock type and origin are unknown, but acquisition, transportation, and handling of that much material involved considerable effort.

The uniformity of the depth of Cribs 3–6 at 1.8 m (6 ft) below the surface (a similar depth as the single crib located at the former Lake Hotel dock), suggests the cribs were deliberately razed to this level when the dock structure was removed. This may have been done to reduce them as navigation hazards. Intentional razing to a uniform depth seems more likely than it being the result of ice action, because

Fig. 2.35 *Zillah* docked at West Thumb, about 1900 (Yellowstone NP Archives)

ice rarely gets more than 0.6 m (2 ft) thick in the winter (John Lounsbury, 1996, personal communication). Dock construction date and builder(s) are unknown, but the docks probably went through several periods of rebuilding since first constructed. E. C. Waters undoubtedly constructed the original dock. *Zillah* docked at West Thumb from the 1890s through the 1910s (Fig. 2.35), as did other lake boats (see Fig. 2.31). Photographs show a dock in this area as late as the mid-1930s (Allen and Day 1935:130). It is not known when the dock was removed, but it was likely present until the early 1960s when many older West Thumb facilities were removed and relocated or replaced by the NPS's Mission 66 developments.

Lake Boat Docks (48YE247)

Despite the rich history of tourist-related infrastructure in the Lake Hotel dock area, little material evidence of the various facilities remains today. Before the turn of the century, E. C. Waters proposed and built a dock at Lake, which included the boat management concession headquarters. Shore facilities at Lake included the largest Yellowstone Lake docks (Fig. 2.36), the primary rental boat operation (Fig. 2.37), the main dock for *Zillah* and other lake boats, a boathouse (Fig. 2.38), a marine railway for launching and dry docking boats, and a fish hatchery. Waters built the original dock in the 1890s and completed a long dock extending south from shore with a short east leg by the turn of the century. This dock configuration was used

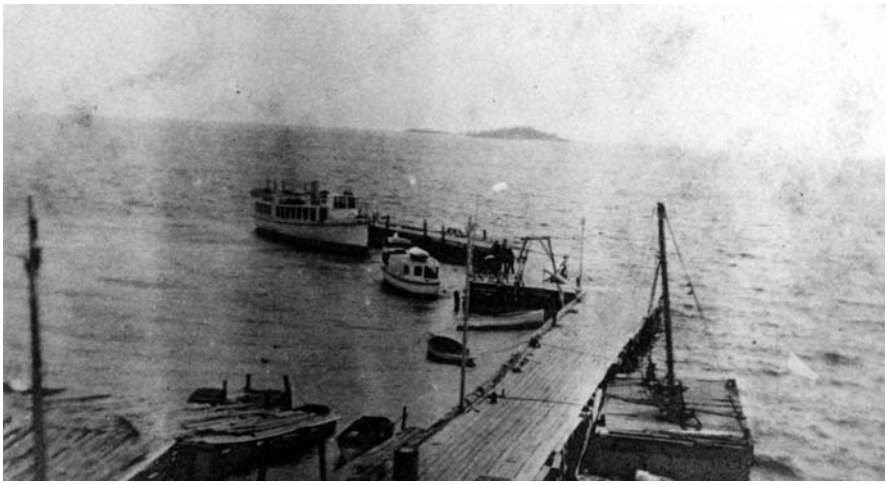

Fig. 2.36 *Jean D* at the Lake dock, about 1905 (Yellowstone NP Archives photo no. 88090)

Fig. 2.37 Lake dock rental boats (Yellowstone NP Archives photo no. 36371)

until major extension and revisions were completed between August and October 1936. These revisions employed a pile driver, as in the original construction. The dock was extended, a launch ramp constructed and a trestle track added from the road to the water providing a means of dry docking large boats, and a small boat

Fig. 2.38 Lake boathouse (Yellowstone NP Archives photo no. 61-699)

ramp was built. All are well documented in the park photographic archives. In spring 1937, the docks were severely damaged by ice, which resulted in additional ice protection measures in October 1938. The fish hatchery was added to the facilities in the 1910s, and all vestiges of these structures, with exception of the boathouse, were removed around 1962.

Underwater features include a single crib remnant from the dock and a short marine railway section still on the lake bottom. The dock crib contains only three courses of logs and has a spike projecting out of the top, the upper end of which is at a depth of 1.8 m (6 ft). In addition, cobbles from additional cribs are spread around the lake bottom, as well as wooden crib members and modern artifacts (Lenihan 1995a:1). Park resource managers and divers conducted a more extensive investigation of the Lake docks in October 1998. They officially recorded the site and issued it an archeological site number, 48YE247. At that time, they observed a large scatter of rocks 4.6 m (15 ft) wide extending in an arc for 274 m (900 ft); a second scatter, also 4.6 m (15 ft) wide, extending for 52 m (170 ft); and four intact rock-filled cribs (Dave Price, 1999, personal communication). The marine railway section is located in shallow water and consists of a short segment of ties and rails still in place. The railway, located just west of the later fisheries dock, was used to launch the *E. C. Waters* in 1905 (Aubrey Haines, 1996, personal communication) and three NPS boats brought to the park in 1936.

Fig. 2.39 Small launch off Lake Hotel. NPS photo by John Brooks

Small Boats

During the archeological survey in the Lake Hotel vicinity, we located and dived a launch on the lake bottom near the dock (Figs. 2.39 –2.40). The launch's rudder was removed by park divers sometime in 1994–1995, and it is currently in the Bridge Bay Marina Ranger Station. In addition, side scan sonar revealed a clear sonogram of a cluster of small boats about 0.32 km (0.2 mile) southeast of Lake Hotel. A single dive on these craft confirmed four boats sitting in 7 m (23 ft) of water (Fig. 2.41). All four are of similar design and oriented in the same direction (Figs. 2.42 –2.45). They ranged in length from 4.11 m (13.5 ft) to 4.72 m (14 ft), and a width from 1.09 m (3 ft 7 in.) to 1.14 m (3 ft 9 in.). All four have small seats fore and aft, two have a single center seat, one has two such seats, and the fourth lacks center seats. They compare exactly with the rental boats shown in Figs. 2.46 and 2.47, which date to 1941 and were apparently scuttled after becoming obsolete.

Fig. 2.40 Hotel launch stern. NPS photo by John Brooks

Zillah

Despite local lore that *Zillah* was taken from the old fisheries dock, towed out to deep water and scuttled, no evidence of it in that area was noted during extensive side scan sonar survey of the area to a depth of more than 60 m (200 ft). This area was selected based on information that *Zillah* rested on the bottom in the general area southwest of the old docks. Archival information on *Zillah*'s fate is contradictory. *Zillah* is described as making "her last voyage out into Yellowstone Lake, where her hull was opened and she came to rest on the bottom where she remains today" (Yellowstone Park Company 1995:7). In another article, reference is made that the Yellowstone Park Boat Company dismantled it in 1929 (Yellowstone Park Company 1976:5). In a telephone conversation with Aubrey Haines after the 1996 fieldwork, he commented that he had found a reference to *Zillah* having been cut up and sold for scrap, perhaps a confirmation of its being dismantled. Definitive references to *Zillah*'s final disposition have yet to be found.

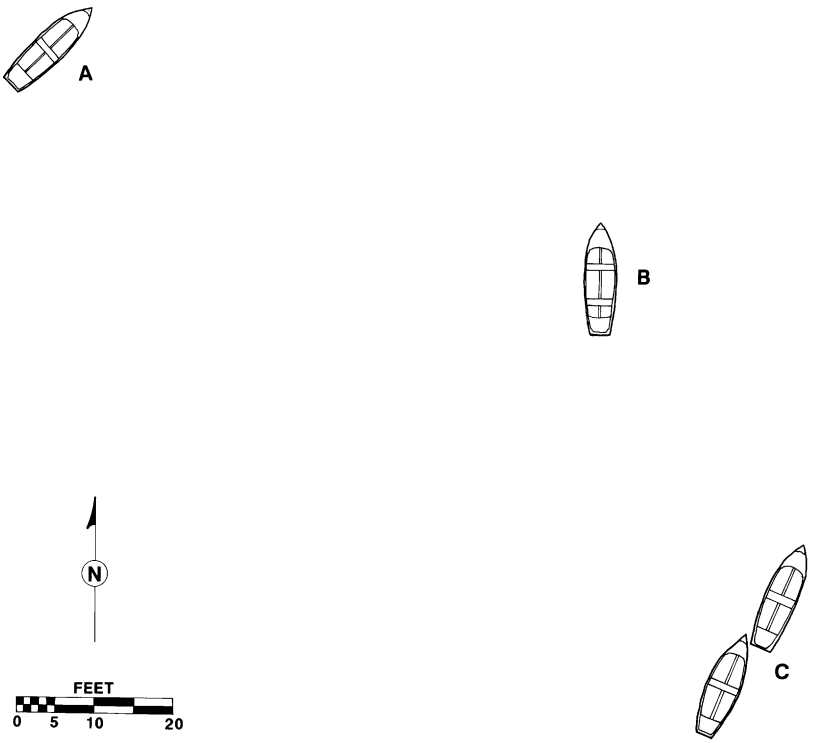

Fig. 2.41 Field sketch of four small rental boats off Lake Hotel. Drawing by Paul Neidinger

E. C. Waters (48YE13)

E. C. Waters, the largest vessel ever operated on Yellowstone Lake, was a 38-m (125-ft) long, wooden-hulled, single-screw passenger steamer with a 8-m (26-ft) beam (Haines 1996b:127). Although depth of hold and tonnage are not documented for this vessel, they are estimated to have been a 3-m (10-ft) depth of hold and between 200 and 250 tons. Today, *E. C. Waters*' remains lay partially exposed and awash on Stevenson Island's east shore (Figs. 2.48 and 2.49). Initial field observations of site 48YE13 suggested the wreckage consists of the largely intact lower hull below the turn of the bilge, much of the drive train (excluding engine and boiler), and many scattered features and artifacts. Major structural features include the keel, main keelson, sister keelsons, floors, the first and second futtocks of most frame-pairs, engine bed, propeller shaft and bearings, thrust bearing, propeller, hull planking, ceiling planking and deck machinery, along with numerous scattered fittings (Fig. 2.50). The hull, listing 27° to port, is 37.1 m (121 ft 7 in.) long from propeller to the forward-most attached hull plank, and the bow points due east.

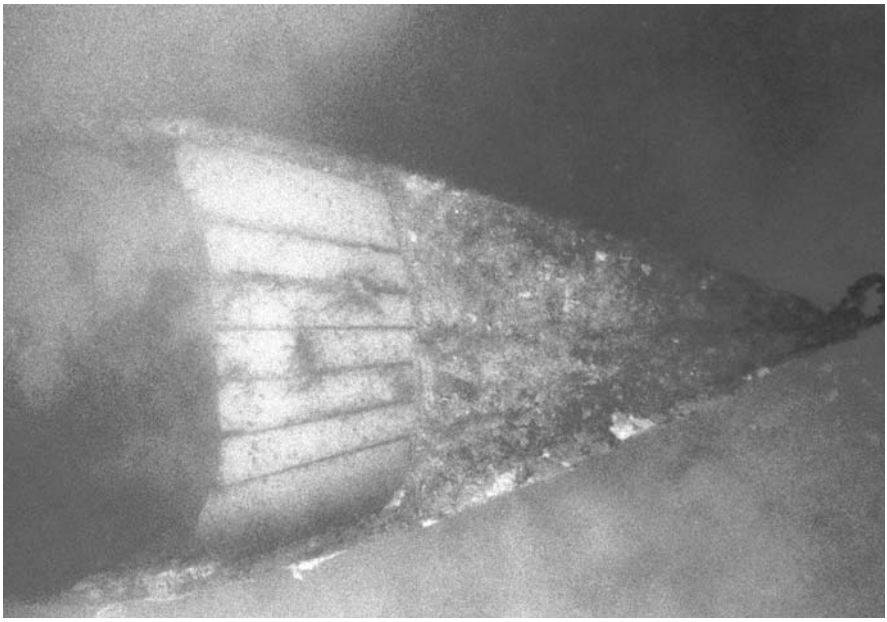

Fig. 2.42 Small boat bow. NPS photo by John Brooks

Fig. 2.43 Small boat bow. Scale in inches. NPS photo by John Brooks

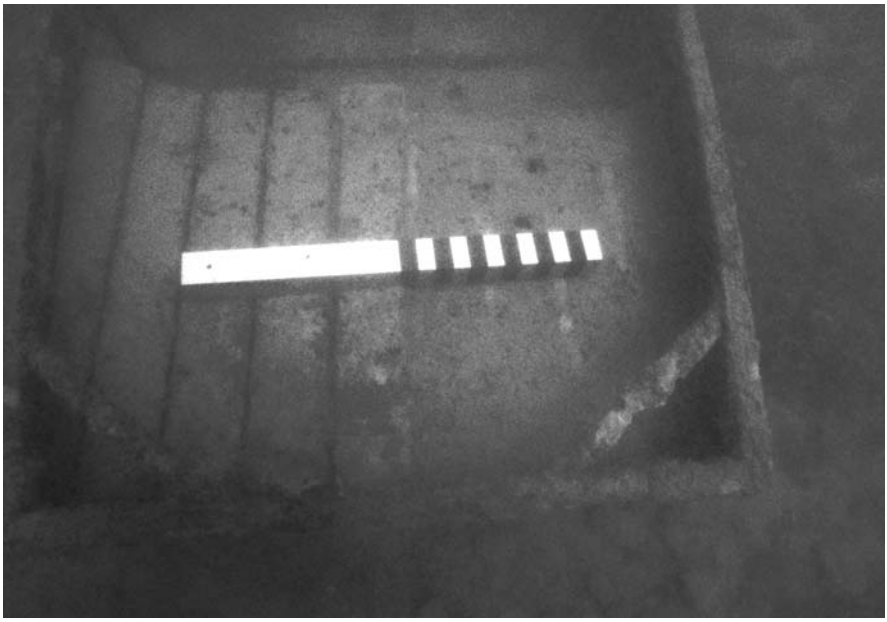

Fig. 2.44 Small boats tern. Scale in feet and inches. NPS photo by John Brooks

Fig. 2.45 Small boat stern. Scale in feet and inches. NPS photo by John Brooks

Fig. 2.46 Yellowstone Park Company rental boat #78 (Yellowstone NP Archives photo no. 29078/12078)

Fig. 2.47 Yellowstone Park Company rental boat #78 (Yellowstone NP Archives photo no. 29078-2)

Fig. 2.48 View southeast of *E. C. Waters*' remains on Stevenson Island's eastern shore. NPS photo by John Brooks

Fig. 2.49 View northeast of *E. C. Waters*' remains. NPS photo by John Brooks

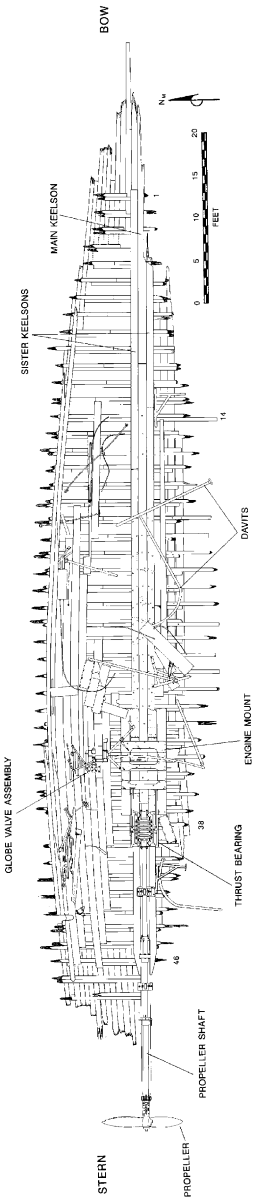

Fig. 2.50 Plan view of *E. C. Waters'* hull remains. Numbers along the lower edge are frame pair numbers. Drawing by Jim Bradford and Matt Russell

The SRC field team, consisting of two archeologists and a photographer, documented the site during a six-day period in August 1996. This site assessment employed a nondestructive, noninvasive approach; no artifacts were collected and only exposed features were documented. The one exception was the capstan, buried in the sand 23 m (75 ft) south of the hull, which was exposed by hand fanning the sediments for documentation and photography and then reburied. The documentation team established a baseline along the wreck's centerline structure and mapped site features using baseline trilateration and direct measurements. The main features, including *E. C. Waters*' hull, remaining propulsion system, and scattered site features were also drawn to scale. Unfortunately, limited time for this assessment did not allow complete documentation of all site details. For example, the many small, portable artifacts located between the vessel frames could not be completely documented, and other details, such as the hull fastening patterns, were documented through recording only a representative sample. No wood samples were taken during this wholly noninvasive site assessment.

Hull Remains

At August 1996 lake levels, the *E. C. Waters*' centerline (keelson and propeller shaft) was just at the lake's surface. Because of the 27° port list, the submerged port side is better preserved than the starboard side, which is mostly exposed above water level. Port-side hull remains are extant to the turn of the bilge, while the starboard-side hull consists of burnt stubs of several floors and futtocks (frames or "ribs"), and a few hull (outer) and ceiling (inner) planks. Overall, *E. C. Waters*' preserved lower hull remains represent a unique opportunity to study turn-of-the-century, high-altitude, Western lake-steamer construction.

The keel is a vessel's main centerline structural member, running the length of the vessel to provide longitudinal support. In wooden vessels it is composed of long timbers, scarfed (joined) together at their ends (Kerchove 1961:418). *E. C. Waters*' keel dimensions are 25.4 cm (10 in.) sided (width), 27.9 cm (11 in.) molded (height), and approximately 35.7 m (117 ft) long. Only 9.3 m (30 ft 6 in.) of the keel's forward part is exposed, and the forward end is splintered and worn with an eroded upward slant on its lower face that has removed any evidence of the keel and stempost joint. The keel's aft end, where it meets the propeller post, or sternpost, is buried, obscuring that joint and making it impossible to determine if the keel had an aft extension to the rudder post, or if the rudder was supported by a rudder shoe, or skeg. Because the keel is buried here, an exact keel length measurement is impossible. One horizontal hook scarf is visible in the keel, beginning 5.6 m (18 ft 6 in.) aft of the keel's forward end. The scarf, which angles up toward the bow, is 1.35 m (4 ft 5 in.) long horizontally, 2.03 m (5 ft 2 in.) long diagonally, with a hook offset of 3.81 cm (1.5 in.). The scarf extends over only three frame pairs, less than the four recommended in the following decade (Desmond 1984:46 [1919]), but long enough to meet required specifications of the more contemporaneous Great Lakes Register (1908:180), which states keel scarf length should be four and one-half times the keel's sided dimension. To meet this requirement, *E. C. Waters*' 25.4-cm (10-

in.)-sided keel required a minimum scarf length of 1.13 m (3 ft 9 in.). Because longer scarf lengths are stronger than shorter ones, *E. C. Waters* was built more conservatively in this regard than required by contemporary Great Lakes practice. There are likely other scarfs along the keel's length, but the rest of the keel is buried and could not be examined.

Other than the worn, splintered forward end, the only other keel damage noted was that the aft end of the forward keel section, below the scarf, was broken-off and missing. This damage is unusual, and there is no evidence of how it occurred. Keel rabbets (for securing hull planks) could not be observed, and no false keel (an expendable plank placed on the keel bottom to protect the keel) was present on the keel's exposed end.

None of *E. C. Waters*' stem assembly remains on-site, and nothing related was located in the surrounding area during a side scan sonar search. The forward-most wreckage consists of the keel, keelson, filler deadwood between the keel and keelson, and outer hull planking. No deadwood was present on top of the forward end of the main keelson.

The vessel's sternpost, or propeller post, is present and is sided 20.3 cm (8 in.) and molded 27.9 cm (11 in.). The sternpost heel, where it joins the keel, and the keel extension or rudder shoe that supports the rudder post and rudder are buried and were not observed. The sternpost protrudes 0.89 m (2 ft 11 in.) above the sediment, to a point just below the propeller shaft, where it is broken off inside the iron bushing assembly that encases it. The stern bearing and other features associated with the sternpost will be described below with the propulsion system.

E. C. Waters' frames are constructed from horizontal pairs of timbers that cross the keel perpendicularly, and are located between the underlying keel and the overlying keelson (Fig. 2.51). These pairs of timbers, made up of floors and futtocks, extended from the keel amidships to the turn of the bilge and continued up the hull side. The frames on *E. C. Waters*' port side are now broken at the turn of the bilge; those on the starboard are broken near the keel. Individual floor and futtock timbers are joined end to end with butt joints that are staggered so that one half of each frame pair overlaps the butt joints of the other half to maximize strength. This paired frame arrangement with staggered butt joints is known as "double framing."

E. C. Waters' framing was constructed using a peculiar combination of the long-and-short-arm method through its midsection (which was the preferred construction method by the turn-of-the-century), and an older style of framing near the bow and stern. The long-and-short-arm method uses two staggered floors of the same length crossing the keel, so that the long arm of one timber is on the same side of the keel as the short arm of the other (Fig. 2.52). The first futtock on each side of the vessel butt-joins the floor's short arm, while the second futtock butts the long arm. In this way, the futtocks are carried up the vessel's side. The older style of framing uses just one floor, centered over the keel, for one half of the frame pair, with the two first futtocks butt-joined over the keel forming the other half. Second futtocks are attached to either end of the floor and third futtocks are attached to the end of each first futtock. This pattern is repeated up the vessel's side (Fig. 2.52).

Fig. 2.51 *E. C. Waters*' frames. View aft of paired frames with butt joints in the wreck's forward port section. The main and sister keelsons overlay the frames in the upper left. Scale = 1 ft. NPS photo by Brett Seymour

The practice of long-and-short-arm framing was introduced before the American Civil War and became the preferable construction technique by the 1870s (*Record of American and Foreign Shipping* 1879:21). The historical shift to long-and-short-arm frame techniques occurred for several reasons, including availability of material and this framing technique's superior strength:

> The practice of placing two sets of floors across the keel having a long and a short arm on alternate sides is of recent origin, and is consequent upon the great difficulty in obtaining first futtocks of sufficient length, size and crook for ships of the largest classes. It is regarded as a great improvement, inasmuch as it rids the keel of the range of butts with which it was covered under the old system. . . (Wilson 1873:197).

Specifications for both the "old system" and the long-and-short-arm framing method were included in the *Rules for the Construction of Wooden Vessels*, published annually by the American Shipmasters' Association through at least 1900. Several standard early-20th-century ship construction manuals do not even mention the older framing style (Estep 1918; Curtis 1919; Desmond 1984[1919]) indicating standardization on the long-and-short-arm frame method. No examples of mixing the early and later framing styles in a single vessel were located in either historical or archeological literature.

Forty-eight frame pairs are present in *E. C. Waters*' hull remains (see Fig. 2.50); all floors and futtocks measure 12.7 cm (5 in.) sided and 22.9 cm (9 in.) molded,

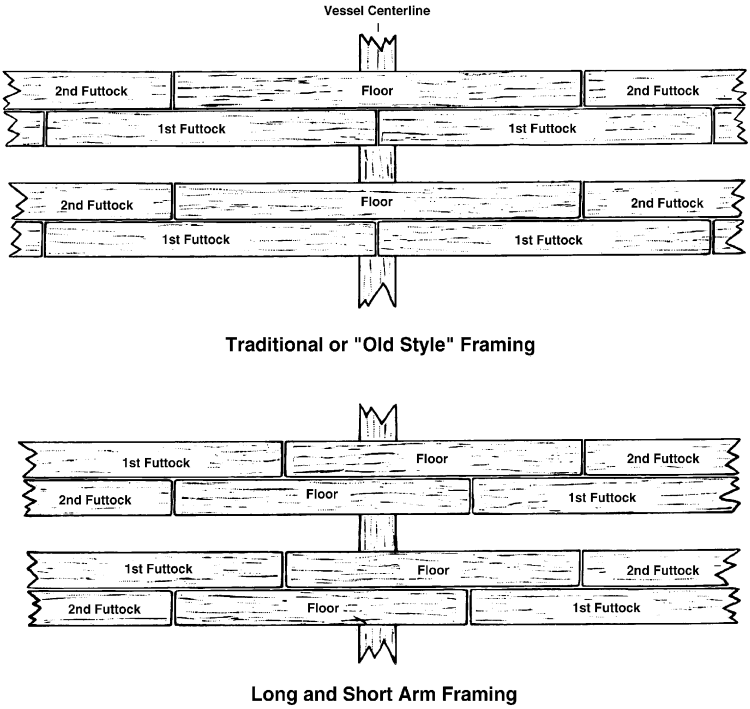

Fig. 2.52 Different styles of framing a wooden vessel. Drawing by Matt Russell

while room and space (distance from the center of one frame pair to the center of the next) is 61 cm (24 in.). As recorded, frame pair no.1 is the first square frame, which crosses the keel perpendicularly. Forward of this square frame were half or cant frames that butted into the deadwood. Half frames remained perpendicular to the keel and became increasingly steep as they formed the pointed ship bow, whereas cant frames rotated forward in a radial pattern. Because no bow framing remains, there is no way to determine if *E. C. Waters*' builders used half or cant frames. The bow filler deadwood exhibits heel notches for the frames and fastener patterns in the outer hull planking indicates several half or cant frames were present. In the stern, two half or cant frames (nos. 47 and 48) notched into the deadwood are still in place on the port side and a notch for a third half or cant frame is present. Fastener patterns on the starboard stern deadwood indicate at least three half or cant frames were used but are no longer present. Frame pairs nos. 1–14, as recorded, were constructed using the older framing style, with a single floor and the port and starboard first futtocks butting under the keelson. Each futtock was fastened horizontally to its mated floor with 1.9 cm (0.75-in.)-diameter fasteners, creating the frame pair. These 14 frame pairs are constructed with the floors forward of the futtocks. *E. C. Waters*' midship section (frame pairs nos. 15–38) is constructed using the long-and-short-arm method, with two staggered floors. Near the stern, frame

pairs nos. 39–46 (the last square frame) revert back to the older style of framing, with a single floor and two first futtocks butted under the keelson, though in these the floors are aft of the futtocks. The last two frame pairs (nos. 47–48), are either half or cant frames, which are mortised into the stern filler deadwood. These frames are perpendicular to the keel, but it was not determined if they are half or cant frames. Only first futtocks are present on *E. C. Waters*' starboard side due to the vessel listing to port when it burned (many futtocks showed evidence of burning on their top ends). There is probably also deterioration from ice, water, wave impact, and vandalism. Several port-side frame pairs' second futtocks are present.

All frame pairs have two limber holes; each hole offset 24.1 cm (9.5 in.) from centerline, allowing for bilge water drainage down the vessel length to the pump wells. The limber holes are roughly rectangular, 3.8 cm (1.5 in.) high, and varying between 7.6 cm (3 in.) and 10.2 cm (4 in.) long. Amidships, beneath the engine mounts, 14 additional floors are present, creating a solid block of athwartship supports that add strength to the vessel's machinery spaces, which bore the combined weight of engines and boilers (Fig. 2.53). Space for two other floors is present in the mount's forward section, but the floors are missing. They may have been purposefully omitted to allow bilge water to pass from one side of the vessel to the other.

Typical of late-19th- and early-20th-century wooden ship construction, *E. C. Waters* was built with multiple keelsons. Keelsons are fore-and-aft centerline timbers extending the vessel's length, located on top of, and fastened through, the floors into the keel, tying the main centerline structures together into a solid unit. *E. C.*

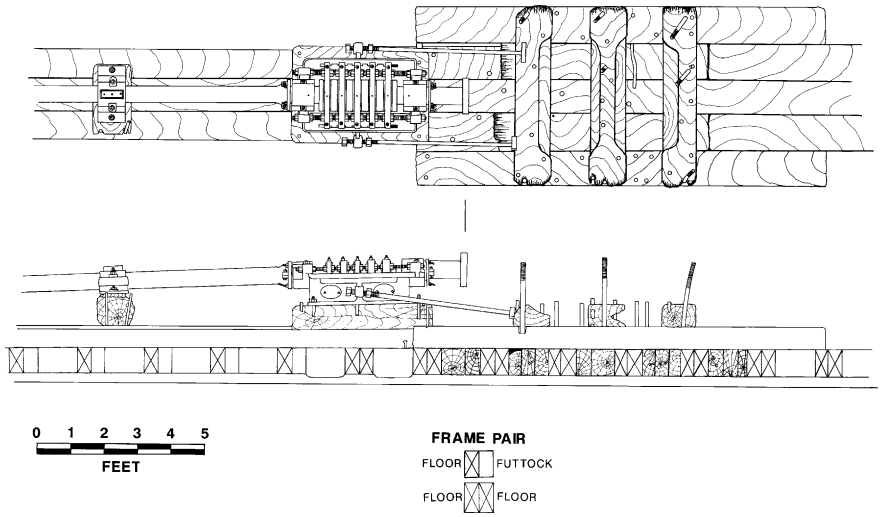

Fig. 2.53 Plan and elevation of engine bed and thrust bearing showing additional frames to support engine weight. Drawing by Jim Bradford

Waters has a main keelson and two sister keelsons, the latter being slightly smaller timbers flanking the main keelson on either side. The forward end of the main keelson is broken and splintered, but is the same length as the keel, suggesting it is almost fully intact. With the exception of the port garboard strake (the outer hull plank closest to the keel), which extends another 0.45 cm (1 ft 6 in.) forward of the keelson and keel, the keel/keelson structure is the forward-most articulated hull structure. A single outer hull plank extends further forward on the port side, but it is loose and not fastened to other timbers. The main keelson extends aft to the sternpost. Its total length is 35.47 m (116 ft 4 in.), and its dimensions are 27.9 cm (11 in.) sided and 25.4 cm (10 in.) molded. Like the keel, a single horizontal scarf is visible on the main keelson, beginning 9.34 m (30 ft 8 in.) aft of its forward-most end. Because the main keelson is flanked on both sides by sister keelsons, no details of this scarf could be observed. It could not be determined if the scarf is angling forward or aft, or what type of scarf it is. Because the keel and both sister keelsons used hook scarfs, however, it is reasonable to expect the builder used this scarf when assembling the main keelson. Given the main keelson length, at least one additional scarf would be expected, probably hidden by the engine bed aft of midship.

E. C. Waters' sister keelsons flank the main keelson, but are slightly shorter. The port sister keelson appears to be complete, its forward end cuts straight 3.30 m (10 ft 1 in.) aft of the main keelson's forward end, just forward of frame pair no.1. In the stern, the port sister keelson ends 4.24 cm (13 ft 11 in.) forward of the main keelson's aft end. This gives the port sister keelson a total length of 28.55 m (92 ft 2 in.); both sister keelsons measure 25.4 cm (10 in.) sided and 20.3 cm (8 in.) molded. The starboard sister keelson's forward end is broken off 2.62 m (8 ft 7 in.) aft of the port sister keelson's forward end. The starboard sister keelson ends in the same place as the port sister, giving it a total length of 25.5 m (83 ft 8 in.). The aft ends of both sister keelsons taper from their full sided dimension of 25.4 cm (10 in.) to 6.4 cm (2.5 in.). The port sister keelson was notched over the frames from the engine bed forward. The notches are 1.27 cm (0.5 in.) deep at the engine bed and get progressively deeper moving forward so they are notched 14.0 cm (5.5 in.) over frame pair no.1. Like the keel and main keelson, each sister keelson has a single visible horizontal hook scarf. The scarfs are offset by several feet, are slightly different lengths, and angle in opposite directions. The port sister keelson scarf begins 10.13 m (32 ft 1.5 in.) aft of the port sister keelson's forward end and is 1.79 m (5 ft 10.5 in.) long horizontally. Its nibs (ends) are 3.8 cm (1.5 in.), the hook is 2.5 cm (1 in.), and it angles up toward the bow. The starboard sister keelson scarf begins 0.41 m (1 ft 4.5 in.) forward of the port sister keelson scarf, is 2.03 m (5 ft 2 in.) long horizontally, has 3.8-cm (1.5-in.) nibs and hook, and angles up towards the stern. Most likely, the slight offset and opposite angles were intentionally designed to increase the centerline structural strength. As with the main keelson, though no other scarfs are visible in either sister keelson, it is likely they are present and probably obscured by the engine bed.

Both outer hull and ceiling planking are present across the *E. C. Waters* site. The vessel's outer hull planking is 7.6 cm (3 in.) thick and 17.8 cm (7 in.) to 27.9 cm (11 in.) wide, depending on where tapering is required by the hull form. The gar-

board strake, the first hull plank butting the keel, is 10.2 cm (4 in.) to 12.7 cm (5 in.) thick. Hull plank lengths vary, but the longest one, a starboard hull plank, is 9.39 m (30 ft 1 in.) long. Hull planking is attached to each frame with 5.1-cm (2-in.) or 8.9-cm (3-in.) square spikes. Ceiling, or interior, planking, 5.1 cm (2 in.) thick and 25.4 cm (10 in.) to 30.5 cm (12 in.) wide, is fastened to each frame with two 1.3-cm (0.5-in.)-diameter round spikes. The starboard limber board (longitudinal planks lying atop the floors) butts the starboard sister keelson and is fastened with spikes, but the port limber board shows no evidence of fasteners. Portions of three bilge strakes (thick planks) are in place on the starboard side. Bilge strakes are thick timbers at the turn of the bilge that add additional longitudinal hull support. On this vessel these strakes are 14.6 cm (5.75 in.) wide x 11.4 cm (4.5 in.) thick, made of multiple lengths joined with 0.91-m (3-ft)-long plain scarfs, and fastened to the frames with 1.9-cm- (0.75-in.) or 2.5-cm (1-in.)-diameter clinch bolts.

In addition to the frames, main keelson and sister keelsons described above, the engine bed or foundation incorporates several other elements (see Figs. 2.50 and 2.53) to strengthen the hull in the machinery spaces. As mentioned above, additional floors were placed between the regularly spaced frames, creating a nearly solid block of timbers under the engine bed. The sided dimensions of these added floors vary between 7.6 cm (3 in.) and 17.8 cm (7 in.). Two timbers measuring 3.81 m (12 ft 6 in.) long, 0.5 m (1 ft 1 in.) sided, and 25.4 cm (10 in.) molded were placed outside each sister keelson to help support the engine. Because the molded dimension of the sister keelsons is 5.1 cm (2 in.) less than the main keelson and the engine bed timbers, a 5.1-cm (2-in.)-thick cover board was fastened over each sister keelson, between the main keelson and the outside timber, making a flush surface to fasten the engine bed frames. The engine bed frames are three transverse timbers fastened to the platform with four to seven 1.9-cm (0.75-in.)-diameter fasteners plus three to four 5.1-cm (2-in.)-diameter threaded bolts that also secured the engine to the three timbers. The bed frames vary in their sided dimensions; the aft timber is sided 0.30 m (1 ft), the middle timber is sided 0.33 m (1 ft 1 in.), and the forward timber is sided 0.41 m (1 ft 4.5 in.). They are all 1.62 m (5 ft 4 in.) long and measure 25.4 cm (10 in.) molded. The timbers are shaped to accept the underside of the engine and allow clearance to the engine crankshaft.

In addition to the intact hull bottom and associated features, there are many scattered hull planks, ceiling planks, bilge stringers, and frames across the lake bottom to the north, east, and southeast of *E. C. Waters*. Several of the scattered timbers show evidence of burning. A complete, systematic survey of areas beyond the main wreck concentration was not conducted.

Propulsion System and Related Features

As noted above, the engine and boiler were salvaged from *E. C. Waters* sometime after its abandonment on Stevenson Island. The boiler was used for many years to heat the Lake Hotel and later sold for scrap; there is no record of what happened to the engine. Historical research did not locate any specifications on engine or

boiler types and sizes, other than a note that the boiler was a Scotch-type marine boiler (Aubrey Haines, 1996, personal communication). Although *E. C. Waters* was built for use in a unique environment, reasonable speculation can be made about the engine and boiler based on parallels from contemporary vessels.

The first compound (two cylinder) reciprocating steam engines were developed during the 1850s and saw widespread service beginning in the 1860s (Gardiner 1993:106). The idea of compounding, in which high pressure steam entered a small, high pressure cylinder and was then recycled to a larger, lower pressure cylinder before being vented or condensed, greatly improved marine steam engine efficiency. This idea was improved upon even further with the triple expansion engine, which added a third cylinder to the basic compound design. Triple expansion engines were first developed during the 1870s and became popular during the 1880s and 1890s; they continued to be built well into the 20th century. At the turn of the century marine steam technology branched into two distinct lines: (1) the reciprocating engine, which reached its pinnacle with the quadruple expansion engine, and (2) the steam turbine, which became more widespread and eventually eclipsed the reciprocating engine (Gardiner 1994:152–154). As with the introduction of the compound engine 50 years earlier and the triple expansion engine 30 years earlier, the most technologically advanced machinery was initially only used in the most profitable trades, such as in Atlantic passenger steamers. It is unlikely *E. C. Waters* carried the most modern steam engine available.

As asserted by Haines (1996, personal communication), there is no question *E. C. Waters* would have been equipped with a cylindrical, or Scotch, boiler. The Scotch boiler was developed during the 1860s and was a great improvement over the firebox boiler, which used many flat surfaces, because it could withstand much greater steam pressures. Scotch boilers were fitted in ships until the mid-20th century (Gardiner 1993:106–107). Although there is no historical documentation on *E. C. Waters*' steam engine, configuration of the bed frames and the size of the thrust bearing indicate either a compound engine (most likely), or a double simple engine, of about 80–100 hp was used in combination with a single Scotch boiler (Ian Ablett, 1999, personal communication).

The only evidence remaining of *E. C. Waters*' engine is the wooden engine bed and the bolts that secured the engine to the bed. The boiler is represented by four iron or steel saddles (Figs. 2.54 and 2.55) that supported the boiler and served to distribute the concentrated weight of the boiler and its water over a larger area through the main keelson and other wooden members of the hull. These four saddles are scattered in the general debris within the vessel's hull, a pattern most likely the result of salvage activity. Each saddle is triangular with one concave side to accept the rounded boiler shell, and is notched on one edge for mounting in the hull. There is no evidence of direct fastening of the boiler to the saddles, indicating metal straps or stays with turnbuckles may have been used to secure the boiler to the vessel.

With the exception of the engine and boiler, the rest of *E. C. Waters*' propulsion system is intact within the wreck (Fig. 2.56). This includes the thrust bearing; propeller shaft with two shaft bearings, the after bulkhead stuffing box and gland, a single shaft coupling, and the stern tube with stuffing box and gland; an

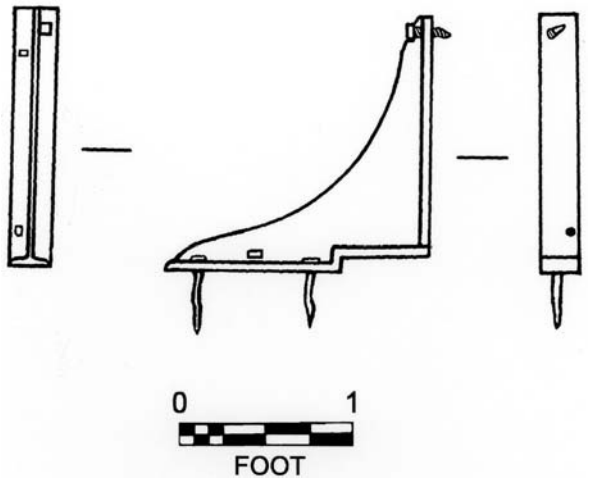

Fig. 2.54 Side and end views of boiler saddle. Drawing by Jim Bradford

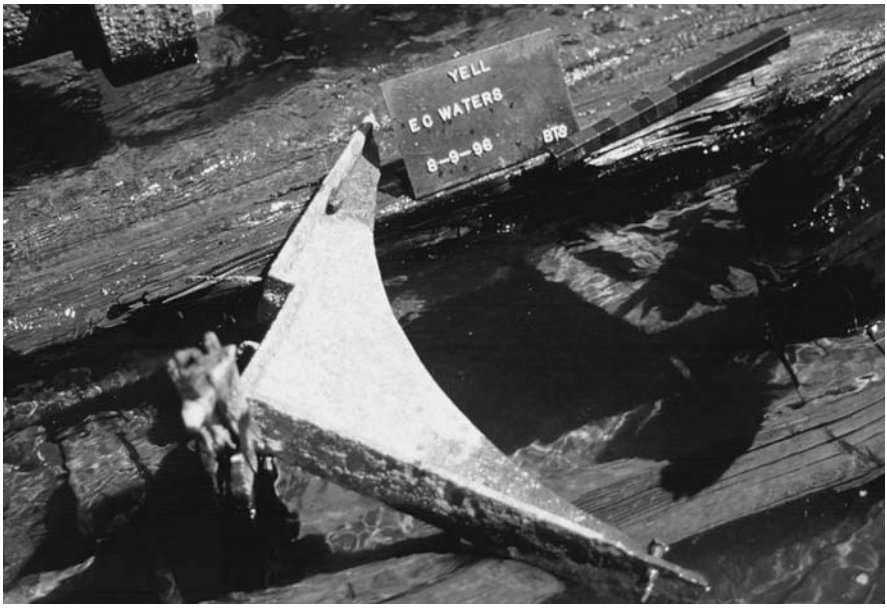

Fig. 2.55 Boiler saddle. Scale = 1 ft. NPS photo by Brett Seymour

adjustable stern bearing assembly; and the propeller. Total length from crankshaft coupling forward of the thrust bearing to the aft end of propeller hub is 11.55 m (37 ft 10.5 in.).

E. C. Waters' thrust bearing (Figs. 2.53 and 2.57) is a multiple-collar block developed during the 1850s and in near-universal use by the later part of the 19th

Fig. 2.56 View west of *E. C. Waters*' propulsion system. The engine bed is in the foreground, the thrust bearing is in the middle foreground and the propeller shaft and the propeller is in the background. NPS photo by John Brooks

century (Gardiner 1993:100). The purpose of the thrust bearing, or thrust block, is "to receive and to transmit to the ship the thrust produced along the line of shafting by the revolution of the screw" (Yeo 1894:83). The thrust bearing is generally positioned near the forward end of the propeller shaft, just aft of the engine, and consists of a block with removable cap. The shaft, at this part of the drive train, is composed of a number of collars while the thrust bearing has a corresponding set of internal collars; in this case, six thrust collars separated by five horseshoe bearings. When the propeller thrust is transferred up the propeller shaft, the shaft collars press upon either the forward or aft faces of the thrust bearing collars, depending on which direction the vessel is going. In either direction, the screw tends to force the shaft slightly forward or aft, but that pressure is taken by the block and, through the strong support on which it is fixed, transferred to the hull.

Fig. 2.57 Starboard side of thrust bearing. NPS photo by Jim Bradford

Adjustment of the thrust block is made with large set screws on either side of the block, while the forward end has a shaft coupling to accept the engine crankshaft. *E. C. Waters*' thrust bearing measures 1.02 m (3 ft 4.5 in.) long × 1.12 m (2 ft 2 in.) wide, and is 0.45 m (1 ft 6 in.) high. It is mounted on a pillow, or plummer, block solidly attached to the main and sister keelsons; the pillow block measures 1.22 m (4 ft) long, 0.88 m (2 ft 10.5 in.) wide, and 25.4 cm (10 in.) high.

E. C. Waters' propeller shaft is intact aft of the thrust bearing (see Fig. 2.56). The forward part of the propeller shaft, or line shaft, is 15.2 cm (6 in.) in diameter and articulates with a 20.3-cm (8-in.)-diameter stern tube in which the aft part of the propeller shaft, or tail shaft, spun. Typically, propeller shafts are hollow, with internal diameter about half the external diameter. The tail shaft within the stern tube is usually larger in diameter than the line shaft, about the same size as the crankshaft attached to the engine. In this case, the tail shaft, where it exits the stern tube and stern post, is 19.1 cm (7.5 in.) in diameter (3.8 cm [1.5 in.] larger than the line shaft) and tapers aft through the propeller hub, or boss.

There are two shaft bearings on *E. C. Waters*' propeller shaft (Figs. 2.58 and 2.59). Their purpose is to support the weight of the shaft and provide lubrication through the oil boxes atop the cap covering. They rest on wooden blocks called pedestals, which are secured to the main keelson.

Located midway between the two shaft bearings, just forward of the shaft coupling, is the after bulkhead stuffing box and gland (Fig. 2.60). It consists of two flanges of two halves each. The upper and lower half of each flange is clamped

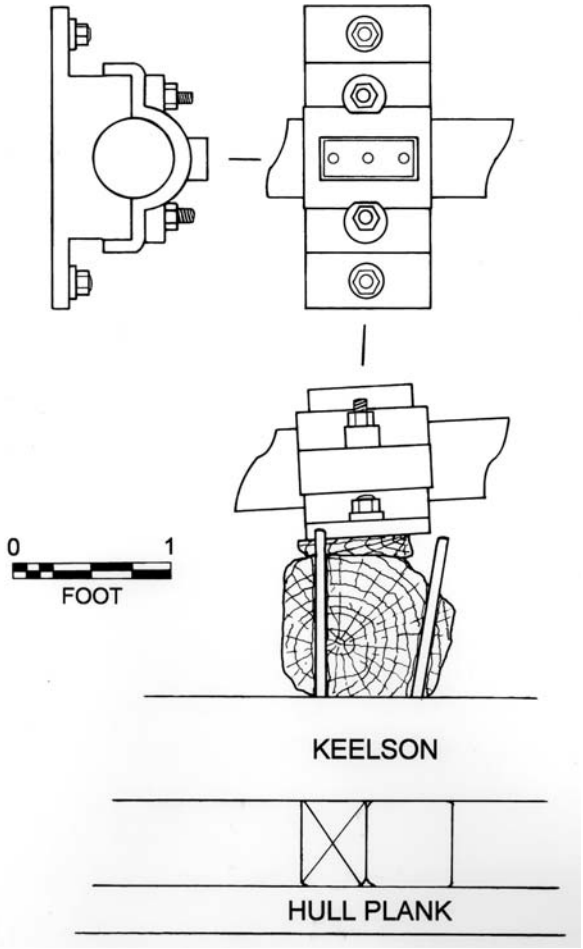

Fig. 2.58 Plan, elevation, and end views of forward propeller shaft bearing. Drawing by Jim Bradford

around the propeller shaft and the two flanges are bolted together, connected by a liner that surrounds the portion of the shaft between the two flanges. This liner, connected to the smaller forward flange, serves as the gland while the larger aft flange serves as the stuffing box, resulting in a watertight connection bolted to the after bulkhead. This feature did not carry the weight of the shaft, but provided a watertight opening through the bulkhead. The bulkhead created an aft compartment that held the shaft coupling and aft shaft bearing.

The shaft coupling (see Fig. 2.60) is a typical design and connected the two propeller shaft sections between the thrust bearing and the propeller. Flanges are forged to the end of each shaft and bolted together with 2.5-cm (1-in.)-diameter

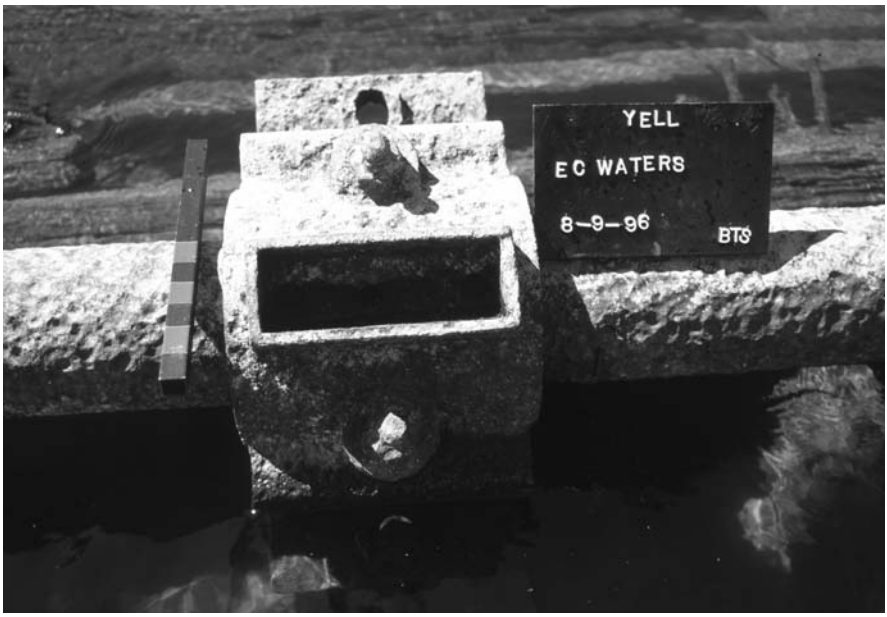

Fig. 2.59 Top view of propeller shaft bearing. Scale = 1 ft. NPS photo by Brett Seymour

Fig. 2.60 View southeast of after bulkhead stuffing box and gland (*left*), and propeller shaft coupling (*right*). NPS photo by Brett Seymour

Fig. 2.61 View southwest of forward end of stern tube stuffing box and gland. Note large bolt on *top* that secured the shaft to the stern deadwood (now missing) through which it passed. Marked section of scale = 6 in. NPS photo by Brett Seymour

bolts. The aft flange has a 25.4-cm (10-in.)-diameter neck, 14 cm (5.5 in.) long, which steps down to the 15.2-cm (6-in.) diameter propeller shaft. Three feet aft of the coupling is the second shaft bearing (see Figs. 2.59 and 2.60).

Three feet aft of the second shaft bearing is the stuffing box and gland on the forward end of the stern tube. The stern tube stuffing box (Fig. 2.61) consists of a flared end of the stern tube with a square flange formerly bolted to deadwood through which the stern tube presumably passed. The gland is a circular flanged tube inserted into the stuffing box and compressed against a fibrous material to make the seal watertight (see Paasch 1890:104, 118; McEwen and Lewis 1953:201).

The stern bearing and bushing assembly is located outboard between the sternpost and propeller, where the propeller shaft exits the sternpost (Figs. 2.62 and 2.63). It consists of a vertical plate bolted to either side of the sternpost and a two-piece iron casting that clamps over the propeller shaft and is bolted to the sternpost. In addition, a wide band, bolted together below the iron casting, wraps around the latter and bolts together above the assembly where a 1.67 m (3 ft 3 in.)-long, threaded, bolt connected through the horn timber. This assembly tied the shaft, sternpost, stern bearing, and horn timber together and provided stability against vibration at the propeller shaft's aft-most end. Similar assemblies have been documented archeologically on *Chisholm* at Isle Royale National Park (Lenihan 1987:224) and *Ottawa*

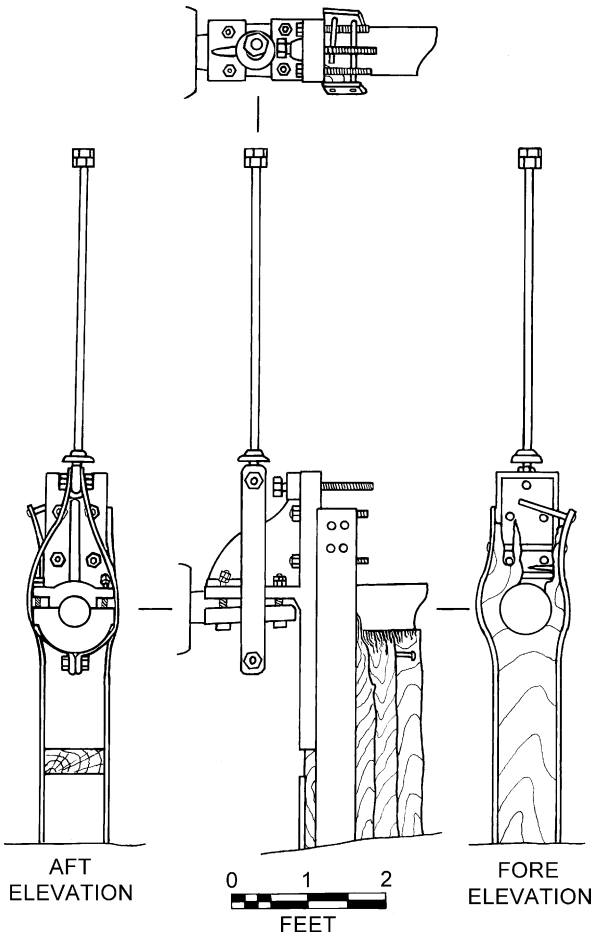

Fig. 2.62 Plan, starboard elevation, fore and aft views of adjustable stern bearing assembly. Drawing by Jim Bradford

in Red Cliff Bay, near Apostle Islands National Lakeshore (Cooper et al. 1991:114), both in Lake Superior.

E. C. Waters' propeller is typical of lake steamers. It is cast iron with four blades, though two blades are broken off about 0.3 m (1 ft) from the hub, or boss (see Figs. 2.63 and 2.64). The two complete blades are elliptical in shape, 1.11 m long × 0.74 m wide (3 ft 8 in. long × 2 ft 5 in. wide) and varying in thickness from base to tip. The boss, 0.36 m (1 ft 2.5 in.) long, is circular in cross-section and has convex sides in profile. It has a diameter of 22.9 cm (9 in.) at each end and is 0.38 m (1 ft 3 in.) in diameter in the middle. The boss and blades are cast as one piece and are keyed to the shaft end and secured with a large hexagonal, keyed nut.

Fig. 2.63 View north, starboard side of adjustable stern bearing assembly (*center*) and propeller (*left*). NPS photo by John Brooks

Disarticulated Machinery and Other Features

Several features associated with *E. C. Waters*' machinery are located within the hull or near the vessel remains. One of the most prominent is a globe valve mounted in the hull bottom on the engine bed's port side (Figs. 2.65–2.67). This valve was the main lake water inlet for supplying water to the boiler and auxiliaries. The valve contains all of the features of an ordinary stop valve as shown in Lyon and Hinds (1915:76–77), but is an angle rather than a straight-through valve. The intake is through a feed water pipe fitted in the wooden block on which the valve is secured.

E. C. Waters' capstan is located 23 m (75 ft) south of the engine bed, buried in the sand in about 0.46 m (1.5 ft) of water (Figs. 2.68 and 2.69). Before 1995, the capstan was located on the beach about 9 m (30 ft) south-southwest of the wreck. During SRC's 1995 visit, the capstan was not located and thought by park rangers

Fig. 2.64 View northeast of propeller. NPS photo by John Brooks

to be missing. A depression on the beach marked the location where park rangers remembered it (Lenihan 1995b:5). During the present site documentation, the capstan was found in its current location, apparently moved by would-be looters in a failed attempt to remove it. The capstan is 0.69 m (2 ft 3 in.) high, 0.4 m (1 ft 4 in.) across the drumhead, and its base is 0.66 m (2 ft 2 in.) in diameter. The base plate, spindle, and drumhead are intact, but the barrel is missing. The capstan is geared, indicating it was probably operated with an auxiliary steam engine.

Seven davits are present within the *E. C. Waters'* wreck (Figs. 2.70 and 2.71). Davits are small derricks of various designs used for hoisting boats, ladders, loads, etc. They are often made of forged ingot steel bent to shape, steel tubing, or built-up welded shapes (Kerchove 1961:199). All seven are 7.6-cm (3-in.)-diameter steel tubing, welded at the bend. A davit collar bolted to the deck secured each base, and each davit was braced below the bend. Figure 2.7 shows three sets of davits holding lifeboats on *E. C. Waters*' port side in about 1906.

Three flat iron or steel brackets are present on the wreck, all loose and not in their original location (see Figs. 2.50 and 2.71). These brackets are made from 1.3-cm (0.5-in.) flat iron or steel in a modified L-shape, with a diagonal brace connecting the arm and leg. A base plate measuring 25.4 cm (10 in.) long, 10.2 cm (4 in.) wide, and 1.3 cm (0.5 in.) thick is attached to the bottom of the leg. A 2.5-cm (1-in.)-diameter tab projects through the plate, which allowed the bracket to swivel on the base plate. A similar tab is also present on the top of the bracket. The plates were secured to the vessel with 7.6-cm (3-in.) lag bolts. Holes drilled through the arms

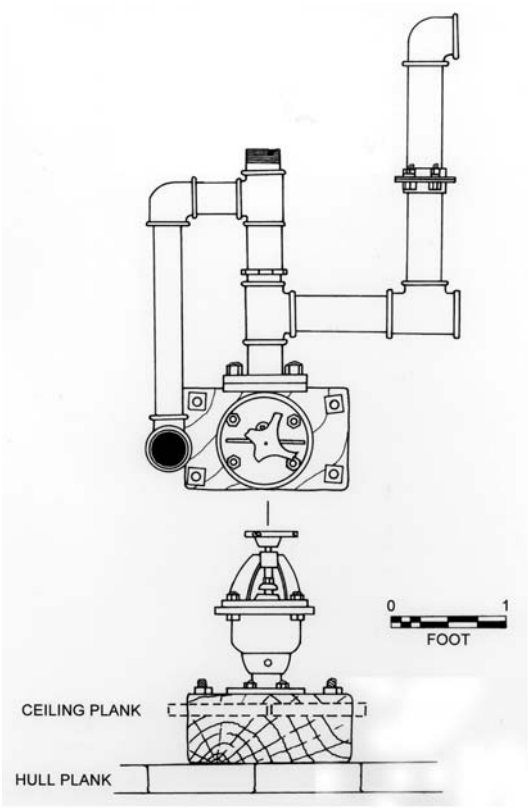

Fig. 2.65 Plan view and aft elevation of the globe valve with intake pipes. Drawing by Jim Bradford

are not identically placed in each piece but are probably evidence of where wooden chocks were attached. These brackets were supports for the lifeboats (see Fig. 2.70) when stowed. They were rigged so as to swing against the cabin and out of the way when the lifeboats were hoisted or lowered.

Various lengths of 2.5-cm (1-in.)-diameter iron or steel rod are scattered across the site. All are bent, and two exhibit particular attributes. One segment, 2.29 m (7.5 ft) long, has the rod curved around to form a symmetrical handle (Fig. 2.72), while the opposite end has a steel plate attached. The plate measures 15.2 cm (6 in.) $\times$ 25.4 cm (10 in.) $\times$ 0.06 cm (1/16 in.) and, on the opposite side of the attached rod, it has a 3.2-cm (1.25-in.) square nut welded to the plate as reinforcement. Its purpose is unknown but it appears to have been a long handle. The second piece was intentionally bent into a "J" hook at one end and has an "eye" on the other end through which an "eye" from a second segment of rod is joined, giving both pieces an articulated connection. Its function is unknown but it could have served as a connecting rod of some kind.

Fig. 2.66 View aft along port midships showing feed water intake piping (*foreground*) and globe valve (*background*). Scale = 1 ft. NPS photo by Brett Seymour

Fig. 2.67 Close-up view of globe valve. NPS photo by Brett Seymour

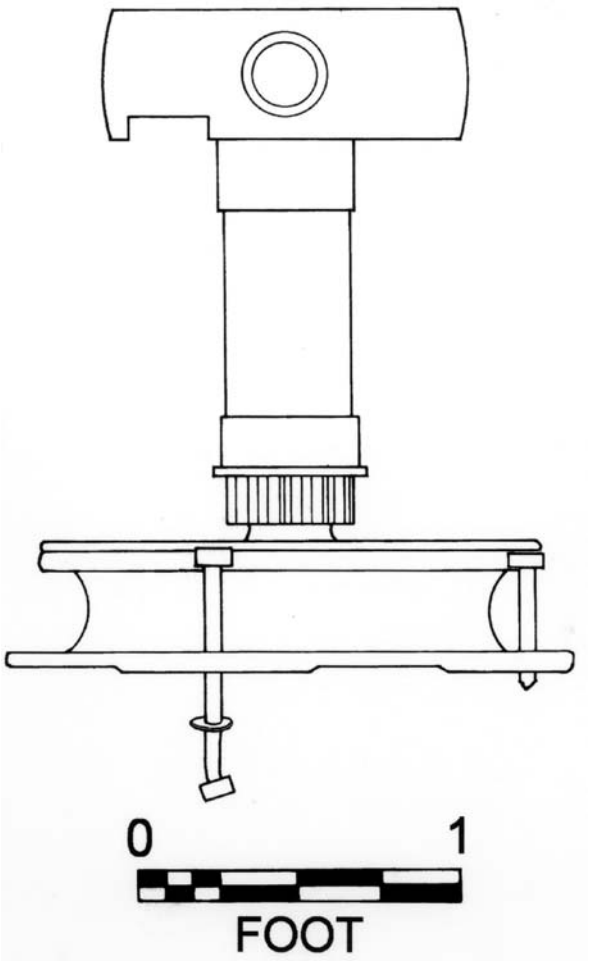

Fig. 2.68 Scale drawing of *E. C. Waters*' capstan. Drawing by Matt Russell

Numerous segments and fragments of iron pipe are scattered throughout the wreck. Lengths vary from a few inches up to 2.44 m (8 ft); most are threaded. Diameters include 1.9 cm (0.75 in.), 2.5 cm (1 in.), 3.2 cm (1.5 in.), 5.1 cm (2 in.), 6.4 cm (2.5 in.), 7.0 cm (2.75 in.), 7.6 cm (3 in.), 8.9 cm (3.5 in.), and 15.2 cm (6 in.). Many examples of pipe tees, elbows, and plugs are also scattered around the hull. Many pipes walls are corroded through. Most were probably part of the main and auxiliary steam systems and several are still attached to the globe valve described above.

Thirteen small iron or steel plates are located within the wreck, most concentrated in two clusters just forward of the engine bed. Each plate (Fig. 2.73a) measures 0.97 m (3 ft 2.5 in.) long × 27.9 cm (11 in.) wide × 0.6 cm (0.25 in.) thick. Two 6.4-cm (2.5-in.) holes are present on each plate's centerline near each end and

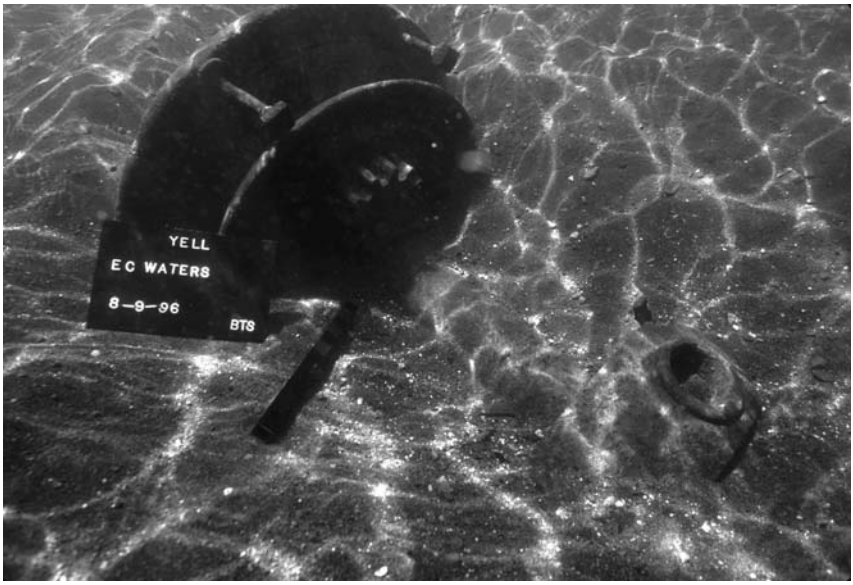

Fig. 2.69 Partially buried capstan. Scale = 1 ft. NPS photo by Brett Seymour

were used to either fasten the plate down or lift it. The tops are patterned with uniform squares raised from the plate's surface, two squares per inch. These provided traction on the plate's surface. On the underside, each plate has eight 5.1-cm (2-in.)-long, 0.6-cm (0.25-in.)-wide, 1.3-cm (0.5-in.)-thick tabs, four along each side. These tabs may have served as small legs upon which the plates rested or, more likely, secured the plates from movement once installed. These plates were probably flooring around the engine or boiler.

A single large iron or steel sheet is present forward of the engine bed (see Fig. 2.50), although it is not secured in its original location. The sheet is 2.27 m (7 ft 5.5 in.) long, 0.61 m (2 ft) wide and 0.6 cm (0.25 in.) thick. It is notched on one end and three 0.6-cm (0.25-in.) square holes are present along one end, each with a 2.5-cm (1-in.)-long square nail in place. Two 1.3-cm (0.5-in.) holes are present along each side, with an additional 0.6-cm (0.25-in.)-diameter hole on one side, while the fourth side has a crudely cut 3.2-cm (1.5-in.)-diameter hole near the edge with a 2.5-cm (1-in.)-diameter bent steel rod through it. Function is unknown, but it may have been a heat shield on top of the keelsons, below the boiler.

A single, uniquely shaped, iron or steel brace is also located within the wreckage (Fig. 2.73b). It is roughly V-shaped and twisted to accommodate whatever it secured with 0.6-cm (0.25-in.) × 10.2-cm (4-in.) carriage bolts. It is very similar to the boat davit braces (Fig. 2.73c) but is shaped to fit a wooden board rather than a metal pole. Its association is unknown.

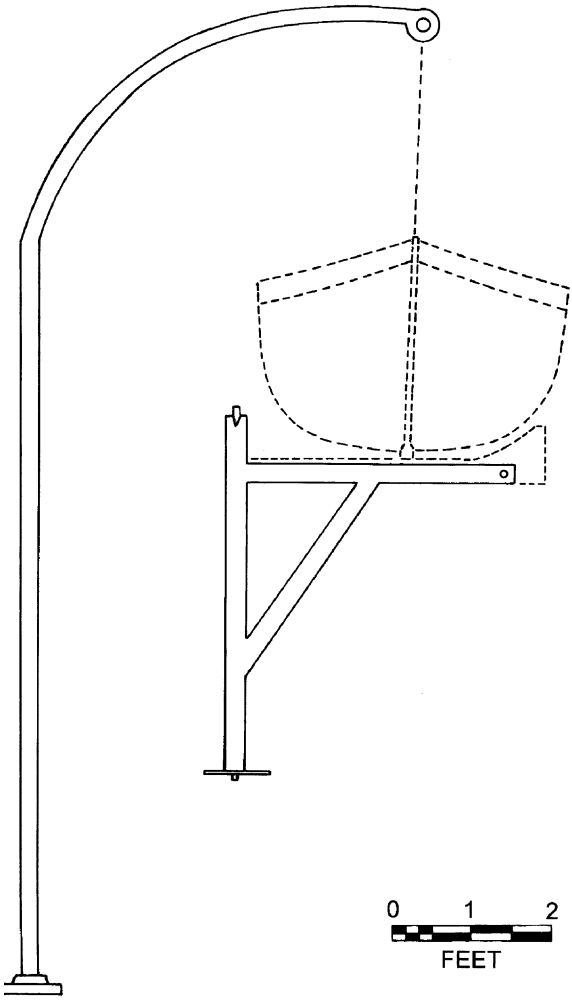

Fig. 2.70 Scale drawing of life boat davit and support bracket showing their relative positions

Three examples of iron or steel strapping are present; one at the wreck's stern (Fig. 2.74), a second in shallow water about 30.5 m (100 ft) south of the wreck's bow, and the third on shore about 60 cm (200 ft) southeast of the wreck. All are at least 15.2 cm (6 in.) wide and 0.6 cm (0.25 in.) thick, and partially buried in the sand. The one on shore is square in shape, the one near the stern is about 3.7 m (12 ft) long and L-shaped, while the third is long with one end curved into a round. None are in their original location, and their functions are unknown.

Fig. 2.71 Davit (*left*) and support bracket (*right*) within *E. C. Waters*' wreckage. NPS photo by Brett Seymour

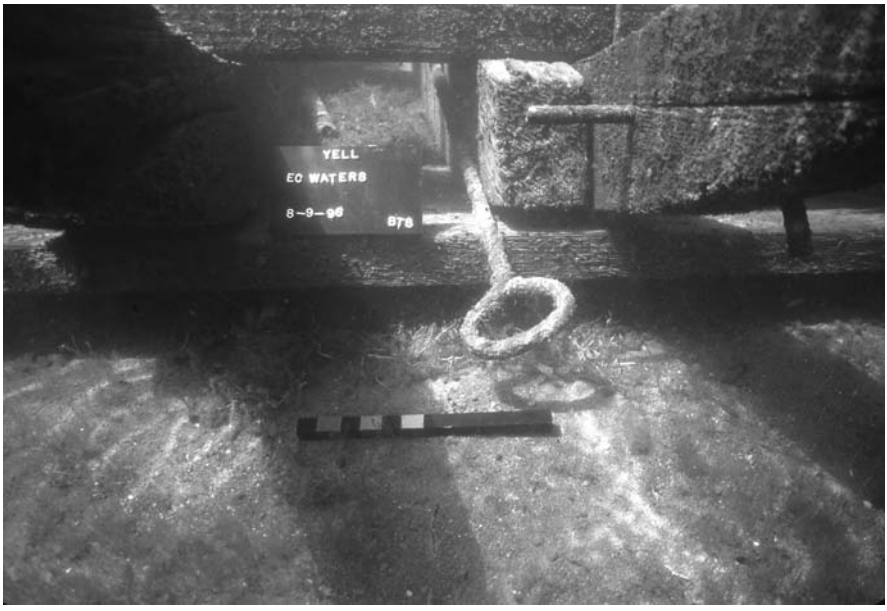

Fig. 2.72 Metal rod handle wedged between frames on the port side turn of the bilge. Scale = 1 ft. NPS photo by Brett Seymour

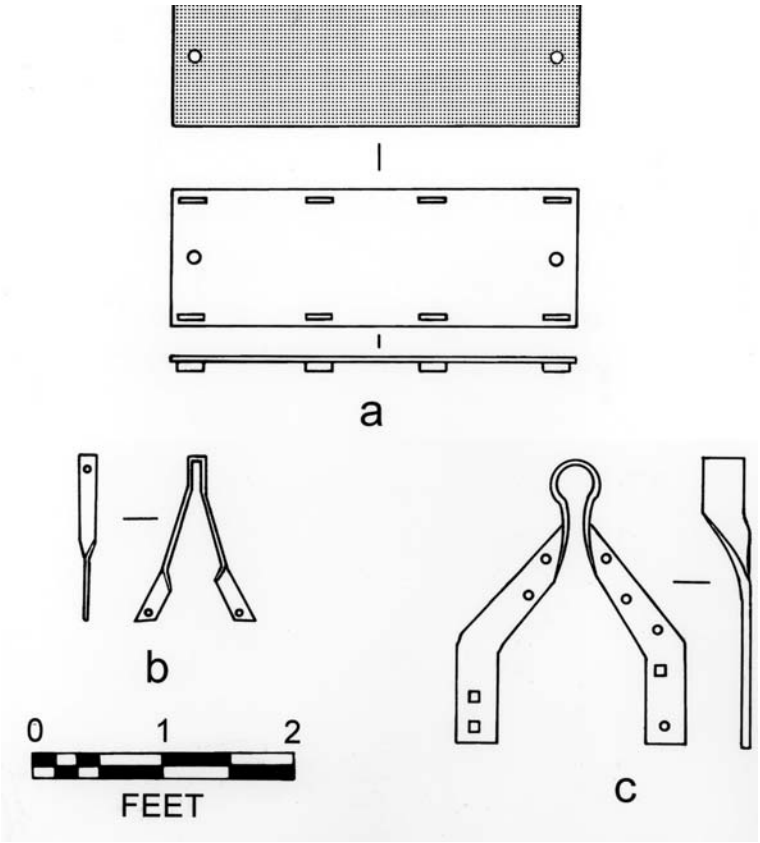

Fig. 2.73 (**a–c**) Plan and profile views of flat metal plate (a) "V"-shaped brace (b) and boat davit brace (c). Drawing by Jim Bradford

Many small, portable artifacts are located between *E. C. Waters*' frames, including two pieces of 2.5-cm (1-in.)-thick glass (Fig. 2.75). Small slivers of windowpane glass were also noted on the site, probably from the cabin windows. Three small pieces of hardware were also observed. One is a small cabinet door hinge, one is a brass keyhole plate, and the third is part of a door lock jamb. All would have been located in *E. C. Waters*' pilothouse or cabins. These are only the most noteworthy of the many artifacts on the site.

A variety of fasteners is located across the wreck. These fasteners range from small wire nails to hull spikes and clinch pins. Many of the items described above were fastened to the vessel with common nails, screws, and bolts. Numerous nails are present along the keelsons and appear to mark locations where blocks of wood supports were, or are, located. These are common nails varying in size from 2d to 10d. Equipment bases, brackets and braces were fastened with 2.5-cm (1-in.) square nails and various sized carriage bolts and lag screws. Smaller wooden members

Fig. 2.74 Iron or steel strap near *E. C. Waters*' stern. Scale = 1 ft. NPS photo by Brett Seymour

Fig. 2.75 Thick glass fragments between *E. C. Waters*' frames. Scale = 1 ft. NPS photo by Brett Seymour

and frame pairs were fastened with 1.9-cm (0.75-in.) pins, while hull planking was fastened with 1.3-cm (0.5-in.) square spikes. The larger wooden elements of the vessel were fastened with 1.9-cm (0.75-in.) and 2.5-cm (1-in.)-diameter fasteners, some threaded to receive nuts to secure metal components.

Analysis and Discussion

The *E. C. Waters* site is unique not only in Yellowstone, but to the entire National Park System. No other high-altitude lake passenger steamer as large as *E. C. Waters* is known to exist in any other park waters. Smaller passenger vessels still exist, in use and as archeological sites, in Glacier National Park (see Russell 1997) and possibly in other mountain parks, as well. By studying the *E. C. Waters'* site, archeologists have a unique opportunity to learn about maritime aspects of tourist economy-development in the world's first national park.

The *E. C. Waters* site shows clears indications of burning more than 70 years ago. The vessel burned to the waterline on its port side and below the waterline on the starboard side as it listed to port. Despite this, the hull bottom, arguably the most diagnostic portion of a ship's hull, is in relatively good condition thanks to the cold, freshwater of Yellowstone Lake. Hull construction is mostly typical of wooden-hulled steamer construction. Scantlings, scarfs, machinery, and general construction style is comparable to contemporary Great Lakes construction rules and practices. Although it is unlikely the vessel was insured or classified by a marine underwriter, it would likely have met all the requirements of published rules and regulations. Even the odd stern bearing arrangement described above has corollaries in the Great Lakes, as evidenced by shipwrecks in Isle Royale and the Apostle Islands. Many small details, such as the keel and keelson horizontal hook scarfs, indicate a seaworthy vessel constructed by a competent shipbuilder rather than a local carpenter without shipbuilding experience. At 2,438 m (8,000 ft) above sea level in the Wyoming mountains, we expected to find more evidence of expediency or vernacular building techniques, neither of which was the case.

E. C. Waters' mixed-style framing pattern, however, is an anomaly; no analogous examples were located in the historical or archeological literature. The obvious question, then, is why did the builders use this framing pattern? By the turn of the century it had been clearly demonstrated that the long-and-short-arm framing method provided greater hull strength than the older framing style because it eliminated butted first futtocks over the keel. Yet *E. C. Waters*' builders created an unusual hybrid of the two framing styles. We can dismiss a functional explanation; mixing framing styles is not a superior way to build a ship's hull. So we turn to a cultural explanation. This mix of frame patterns could indicate multiple builders, one who directed the project during midship construction, and a different one involved in bow and stern framing. Another possibility is that bow and stern timbers were reused from some other shipbuilding project and brought to Yellowstone Lake prefabricated for use in *E. C. Waters*. The unusual framing pattern, then, may reflect recycling and reuse behavior. Lack of unused fastener holes, however, supports multiple builders rather than reuse.

Salvage activity on *E. C. Waters* was also similar to typical salvage behavior seen in the Great Lakes, but differed in one notable way: although the engine and boiler were recycled and reused, the vessel's thrust bearing and propeller were left in place on the wreck. Typically, in coastal and Great Lake environments, if the engines and boilers were accessible enough to be salvaged, then other high-cost, reusable items such as the thrust bearing and propeller were also removed. This is the case on several sites documented in Lake Superior, for example the *Monarch* wreck at Isle Royale National Park (Murphy et al. 1987:264), where engine, boiler, thrust bearing, and propeller were recycled. When the engine and boilers were inaccessible, such as on Isle Royale's *Glenlyon*, then the thrust bearing and propeller were also left in place. In the case of *Glenlyon*, deep water prevented salvage of any reusable equipment. On *E. C. Waters*, however, even though the engine and boilers were removed and the thrust bearing and propeller were easily accessible, they were not salvaged. This likely reflects the unique environment in which the steamer operated. The engine and boiler were easily put to non-maritime use: the boiler was used to heat the Lake Hotel, and although it is unknown where the engine was used, it could easily have been used locally, for example in a lumber mill. The thrust bearing and propeller, on the other hand, had no use other than on another screw steamer. In the Great Lakes or coastal locations, objects like the thrust bearing and propeller could easily be sold for reuse, or possibly for scrap. This was not the case in Yellowstone. With the ascendancy of automobiles after World War I, the commercial viability of another steamboat was marginal at best, and the cost of transporting the salvaged items to a different lake for reuse in another large steamer would likely have been prohibitive. There was no local market for scrap, and transportation costs would have likely exceeded potential returns. Tied into the larger economic processes of industrialization, there was very little incentive to reuse and recycle marine-specific materials from *E. C. Waters*.

The *E. C. Waters* site, as representative of the Yellowstone Lake Maritime System, displays both the expected homogeneity and variability in construction techniques and salvage activity as compared to contemporary Great Lakes maritime systems. *E. C. Waters*' construction and salvage provide insight into aspects of typical maritime behavior that may be unique to the Yellowstone Lake's maritime system. Differences may be accounted for by a variety of cultural and environmental influences, including the isolated, high-mountain setting.

Ultimately, the *E. C. Waters* failed (in that it never carried paying passengers) not because of any technological deficiency, but because of historical contingency; that is, the circumstances for which it was built changed. The passenger trade on Yellowstone Lake was taken over by a smaller steamer, *Jean D*, and it was never economically viable to put the much larger *E. C. Waters* into service. *E. C. Waters* sat idle long enough on Stevenson Island that not only did it outlive its usefulness as a passenger steamer (the passenger trade came to an end after World War I as automobiles came into ascendancy), but even some of its most expensive and valuable elements were not worth recovering. This change is a hallmark of tourism as a dynamic, capital-intensive enterprise in which infrastructural changes occur rapidly to meet the needs of an ever-changing clientele – the tourist. Tourism is a highly

complex phenomenon composed of many disparate but interdependent elements, each of which can adversely affect the others economically with its poor performance (Hunt 1994c:26). Nash (1981:462–463) terms the multiplicity of interdependent elements a "touristic system." He writes that "what its characteristics are and whether it will change or not will be dependent not only on developments in the partner societies, but also on suprasocietal happenings" (Nash 1981:463). The elements of a tourist industry "must be understood by reference not only to the touristic system, but also to outside forces that sustain and shape it" (Nash 1981:463). In the case of *E. C. Waters*, the steamer was marginalized by the changing nature of the tourist trade as dictated by larger forces in society.

Documentation of *E. C. Waters* and other sites in Yellowstone Lake give researchers a tangible link to Yellowstone's turn-of-the-century tourist trade. Few maritime material remains are left in the park representing the new century's burgeoning tourist economy, and several of those, such as the West Thumb docks, the Lake Hotel docks, the small boats off the Lake Hotel, and *E. C. Waters*, are submerged in Yellowstone Lake. Analysis of these important archeological remains provides insight into aspects of these commercial enterprises not recorded in the historical record. Baseline documentation of archeological resources allows researchers to pose particular questions relating to Yellowstone Lake's maritime history and creates the opportunity to study a little-documented facet of Yellowstone's economic development as a tourist destination.

Conclusions

Investigation into the unique remains of Yellowstone Lake's maritime system has clarified many aspects of this subset of the park's tourist system. Because of the intensive nature of the fieldwork that led to this chapter, park archival research was not as comprehensive as we would have liked. We were not able to completely trace many of the intriguing leads located within park archives, photographs, and library. Other complementary regional records and those in Aubrey Haines' possession were not examined. However, researchers were able to obtain sufficient information to describe cultural resources located during fieldwork and evaluate their potential significance.

Some aspects of our study produced negative evidence. For example, we did not locate reported stagecoach parts near Pumice Point or submerged features associated with the Little Thumb Creek facilities. Limited material evidence in some areas, such as the Lake Hotel dock area and West Thumb Geyser Basin, suggests a very efficient effort at removing buildings, docks, etc., from those locales. Additional archival research and oral history collection with former and current park employees would likely augment the history and observations presented in this chapter.

Confirmation of the lake steamer *Zillah*'s fate is one of the most intriguing questions. Data from the remote sensing survey suggest *Zillah* is not on the lake bottom, at least in the primary area identified by local lore. Additional historical research is

necessary before continuing a search for its remains. Little is known about the lake vessel *Jean D*, and more research is required here, too. More is known about *E. C. Waters*, a vessel that may have never carried a paying passenger on the lake.

The West Thumb Geyser Basin dock remains are unquestionably an archeological site that has significant association with park development, particularly regarding lake transportation and tourism. These remains, one of the earliest lake docks, represent a lakeshore tourist destination second only to the Lake Hotel dock. The Lake Hotel docks present very little archeological evidence of its past. The West Thumb Geyser Basin dock remains should be preserved and protected, and they may offer an interpretive potential for both land and diving visitors.

E. C. Waters' remains, along with the Lake boathouse, are the most obvious surviving cultural resources associated with Yellowstone Lake boating history. The wreckage is a destination for present-day lake boat tours, as well as pleasure boaters and fishermen. Site documentation resulting from this study can serve interpretive purposes and as a baseline against which evaluation of future impact can be measured. Interpretation and monitoring of this site is warranted and recommended.

Documentation of *E. C. Waters* and other elements of the Yellowstone Lake Maritime System and their interpretation in a systemic context resulted in a better understanding of the sites and the system of which they were part than if they had been examined as isolated sites. A methodological approach that encompassed a wider context allows a focus on the wreck and other elements of the maritime infrastructure as part of an integrated whole. These sites are directly linked to the larger capitalist world-system through their connection to the Northern Pacific Railroad as well as changing sociological and technological dynamics each of which directly affected the archeological record in and around Yellowstone Lake. Few maritime material remains are left in the park representing the Lake-based tourist economy, but analysis of these archeological remains provides insight into aspects of these commercial enterprises not recorded in the historical record. Baseline documentation of Yellowstone Lake maritime archeological resources allows researchers to pose particular questions relating to Yellowstone Lake's maritime history and the maritime system that developed there, and creates the opportunity to study a little-documented facet of Yellowstone National Park's economic development as a tourist destination. *E. C. Waters* and the Yellowstone Lake Maritime System reflects the economic importance of tourism and its power to transform the landscape, creating an inland maritime system at an elevation of 2,438 m (8,000 ft) above sea level, hundreds of miles from the nearest navigable waterway.

Chapter 3
The Marshall/Firehole Hotel: Archeology in a Thermal River Environment

Annalies Corbin, William J. Hunt, Jr., Christopher Valvano, and M.J. Harris

When tourists came to our nation's first national park in the 1870s, they faced a wilderness where no support or amenities of any kind existed. After passing through Mammoth Hot Springs, the primary route for entering the park, there were no hotels, no laundry services, no stores, and even no roads for the first few years. In 1873, the park superintendent explained that visitors could only reach the park by train, "a mode of travel attended with many privations and inconveniences" (Langford 1873:2; Schullery 2001:228).

The important places to visit were soon well known, however. In addition to the hot springs and geysers at Mammoth Hot Springs, Norris Geyser Basin, Lower and Upper Geyser Basins, and West Thumb, there were sublime vistas such as those at Yellowstone Lake, Grand Canyon of the Yellowstone, and Lower and Upper Falls of the Yellowstone River. Before the "Grand Loop Road" was completed in the 1890s, especially between the Upper Geyser Basin and Thumb, tourists followed a route quite different from that used by modern visitors. Rather than traveling in a figure eight pattern, as today's tourists are wont to do, natural features and lack of roads forced tourists to travel most commonly over a misshapen A-shaped course (Fig. 3.1).

The early visitors usually began their tour at Mammoth Hot Springs. After collecting the final provisions for the tour, parties traveled for one to two days through Norris to the Lower Geyser Basin. The basin was the hub of the 19th-century tour routes. The rough terrain east of the Upper Geyser Basin forced people to make day trips from the north end of the Lower Geyser Basin to see the wonders of the Middle Geyser Basin's boiling pools and, further south, to the Upper Geyser Basin to witness spectacular geysers of hot water erupting from the ground. The Lower Basin's position near the center of the park and its abundant supply of grass and water made an excellent camping spot. From the junction of the Firehole River and Nez Perce Creek (formerly called the East Fork Firehole River), parties could easily pass by wagon or horseback to the east side of the park. This passage marked a

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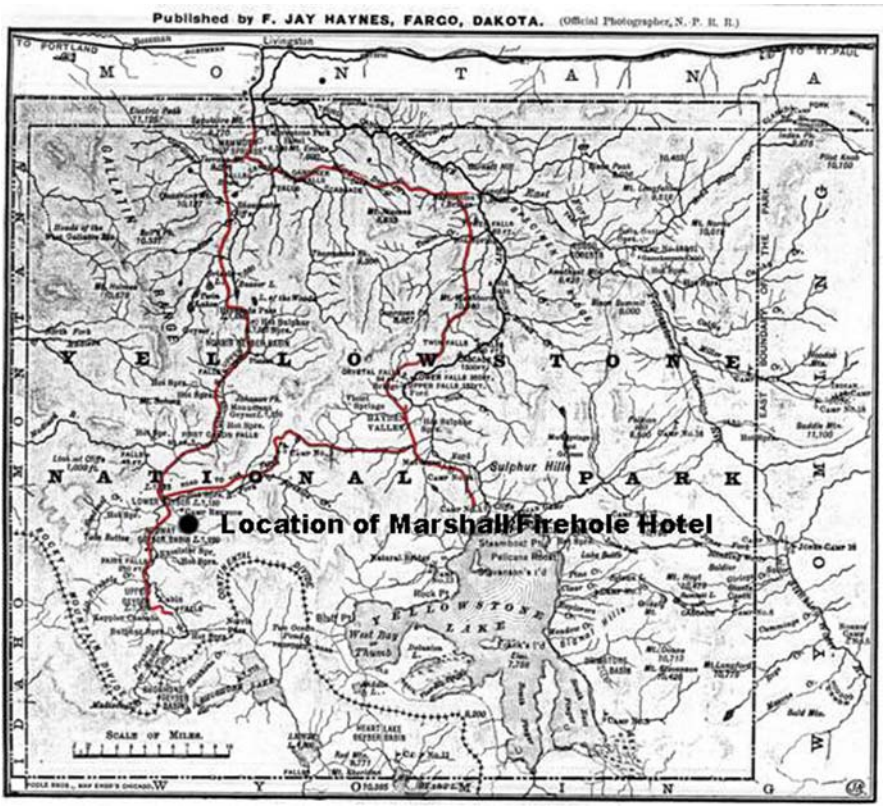

Fig. 3.1 1880s map showing the tourist route at the time of the Marshall/Firehole Hotel's operation (*red* added for clarity) (Courtesy Yellowstone National Park archives)

transition in the tourist experience from experiencing the hellish worlds of sulfurous hot springs to viewing the wondrously sublime vistas of mountain peaks, immense lake, waterfalls, and canyon.

In 1879 there were still only 89 miles (143.23 km) of what most deemed passable roads through the park (Schullery 2001:228), and until 1880, there was no place on this route where tourists could take shelter from nature. Everyone experienced it in its full glory until George Marshall established a small boarding house with his home at the north end of the Lower Geyser Basin. He followed this in 1884 with the first interior hotel concession and tourist complex to be built in a national park, the Marshall/Firehole Hotel (Fig. 3.2). The Marshall/Firehole Hotel continued to provide services to the public until 1891 when the more luxurious Fountain Hotel replaced it. The Fountain Hotel was located nearer to the thermal features concentrated at the south end of the Lower Geyser Basin.

Until recently, the Marshall/Firehole Hotel site (48YE773; Fig. 3.3) was believed to be destroyed by an early-19th-century road barrow pit. Archeological investiga-

Fig. 3.2 The Marshall Hotel, circa 1885, viewed from the north (Courtesy Yellowstone National Park photograph archives, YELL 32046)

Fig. 3.3 The Marshall/Firehole Hotel site as it appears today viewed from the north (Courtesy William J. Hunt, Jr.)

tions in 1993–1994, however, demonstrated that most of the site's structures and features continue to exist. Surprisingly, the hotel site was found to have an underwater component. It appears that people living and working at the hotel dumped trash in the Firehole River. Unfortunately, artifact hunting by the visiting public is rapidly destroying this portion of the site (Hunt 1993a; Hunt et al. 1994).

In FY 2000, in response to continued vandalism of this portion of the site, the National Park Service Intermountain Region awarded a Challenge Cost Share Program (CCSP) grant to the PAST Foundation to conduct an archeological investigation. The CCSP required the Marshall/Firehole Hotel Underwater Archeology Project be a cooperative venture between the National Park Service (NPS) and the PAST Foundation. Participants included archeologists and volunteers from Yellowstone National Park, PAST Foundation, NPS-Midwest Archeological Center, East Carolina University, and students and teachers from the Lincoln Public Schools Science Focus Program School (Zoo School) in Nebraska (Fig. 3.4).

Objectives of the Marshall/Firehole Hotel Underwater Archeology Project were to:

- identify the range of archeological resources at the site and their physical locations;
- determine apparent functional associations when possible;
- reconstruct the landscape/land use plan for the hotel;
- identify site elements impacted by past and current park, public, and natural actions;
- recommend possible interpretation alternatives;
- provide an educational opportunity for the public to participate and learn about archeology.

Fig. 3.4 The 2001 Marshall Hotel/Firehole River field crew. (Courtesy of the PAST Foundation © 2001)

Project Setting and Considerations

The Marshall Hotel site (48YE773) is located on a narrow stretch of ground between the arms of the Firehole River and Nez Perce Creek at the very north end of the Upper Geyser Basin (Fig. 3.5). The elevation at this point is about 7,160 ft (2,182 m) above mean sea level (AMSL). The site is bound on the west by the Firehole River, a stream of constant volume originating south of the Lower geyser basins on the Pitchstone Plateau.

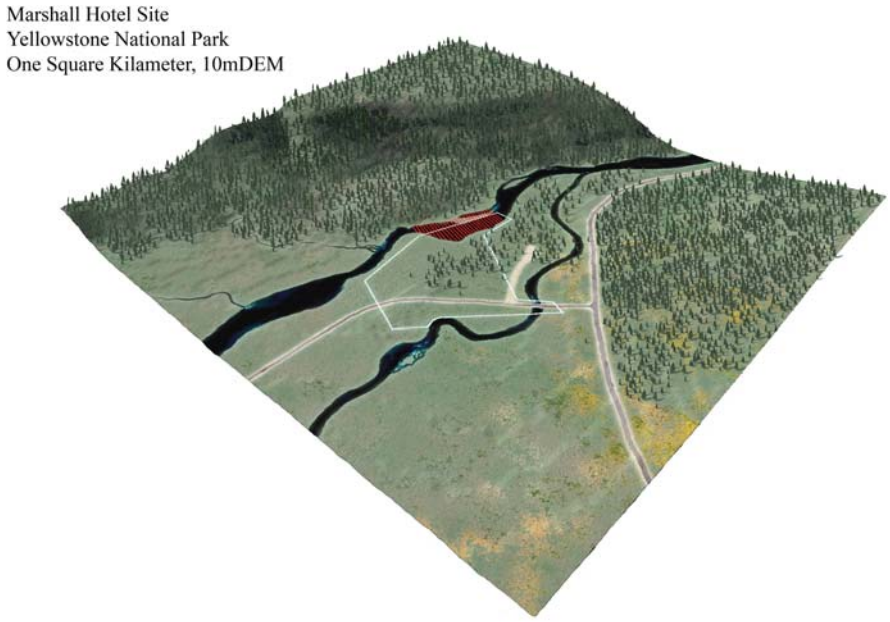

Fig. 3.5 The Marshall Hotel Site located between the arms of the Firehole River and Nez Perce Creek (Courtesy Andy Hall, PAST Foundation © 2001)

"The name 'Firehole' comes from early trappers in the area who saw all the steam rising from the thermal features surrounding the river and thought it was smoke from fires. Their term for a mountain valley was 'hole,' and so the river was named" (Yellowstone National Park 2000:116). Nez Perce Creek forms the site's northern and eastern boundary. Formerly known as the East Branch of the Firehole River, the stream was renamed in 1883 "to commemorate the Nez Perce Indians and their valiant retreat" through the park six years earlier (Haines 1996c:15–16, 72). Although fed by cold springs in their upper reaches, by the time they reach the hotel site the water in both streams is tepid to warm from the large volumes of hot water fed into them along their courses.

The landforms around the hotel site are highly varied and provide former campers and hotel lodgers as well as today's picnickers with a lovely vista for contemplation. The hotel actually sits on a narrow point of land just a few hundred yards south of

the spot where the Firehole Valley narrows abruptly. In less than a mile to the north, the valley constricts even further to become the very narrow Firehole Canyon. On the west side of the site, the land rises abruptly more than 250 ft (76.2 m) from the Firehole Valley floor to the top of the Madison Plateau. The ground rises more gradually to the east as rolling hills stair-stepping to the Central Plateau at the center of the park. To the south, the valley widens into a broad heart-shaped mountain meadow obstructed here and there by small patches of lodgepole pine.

The Lower Geyser Basin actually rests in the northwestern edge of the Yellowstone Caldera whose magma provides heat for powering the park's geysers, hot springs, fumaroles, and mud pots. Thus, one finds the valley margins pocked with individual hot springs at the north end and large concentrations of these thermal features as one moves to the south. The hot spring nearest to the site is the Hygeia hot spring, a minor thermal feature that is historically important since it was the hot water source for the hotel, its laundry, and bathhouses (Fig. 3.6).

Fig. 3.6 Grass strip at right in photo marks the location of a wood pipe that carried hot water from Hygeia hot spring to the hotel (Courtesy of the PAST Foundation © 2001)

Project Rational

This project's fieldwork, analysis, and interpretation of data are hinged on three issues. First, Yellowstone and other national parks contain an immense number of

historical archeological sites which are complex in their form, content, and functional associations. Faced with this complexity, archeologists often find themselves somewhat less than successful with regard to developing historic contexts useful for investigating, understanding, and assessing the significance of these resources. Even historians and historical architects often treat each standing structure or hotel site as unique places, the narration acting more as a kind of "biography" of place than as a means of understanding the development of hotels within a larger cultural context (see Whittlesey 1980; Wheaton 1982; Wilson 1982).

Further, archeological approaches to hotel sites are often simplistic, most focusing on minor aspects of a developed historic hotel complex (Aaberg et al. 1995; Stupka-Burda 1995; Aaberg 1996) Few have approached a hotel site as an entity. Those investigators that have looked at a hotel site in its entirety have examined them as more-or-less unique entities and without interpretive context (Ehrenhard 1972, 1973). Early park hotel historical landscapes have not been considered by archeologists to date. Though many historic hotel sites are situated at the margins of bodies of water, no underwater archeological surveys have been reported. A National Archeological Database (NADB) reports query identified a number of reports focusing on hotel sites; none were underwater studies.

Finally, it should be noted that Yellowstone National Park is one of the most heavily visited sites in the NPS system. Historical archeological sites are clustered along the primary routes of tourist travel through the park and many have been vandalized. Similarly, the underwater component of the Marshall/Firehole Hotel site has been vandalized intermittently over the past years by tourists visiting the nearby picnic grounds and restrooms and by fishermen who gather artifacts from the river as they fish. Knowledge of the component's artifact content and distribution will provide baseline data from which the park's cultural resource managers may assess future damage to the site and resource protection measures.

The Marshall Hotel

The Marshall/Firehole Hotel was a prominent feature of Yellowstone National Park (Fig. 3.7) from 1884 to 1891. Over its life, the hotel occupied two sites along the Firehole River, providing simple tourist lodgings during Yellowstone's early years. The hotel was the first to receive a Department of the Interior concession permit. That permit continued to be in force until completion of the nearby Fountain Hotel in 1891.

George W. Marshall (Fig. 3.8a) was born in Illinois on March 24, 1846. His family lived on a farm and young George attended common school. In 1860, Marshall moved to California and began working as a blacksmith and cattle buyer. Nine years later, he relocated to Ogden, Utah, where he managed the "Junction House" and gained his first experience running a hostelry. In 1872, Marshall moved again, this time to Elko, Nevada, where he operated a stage station for the next four years. In 1875, he married Sarah Romrell (see Fig. 3.8b) and moved to Montana in

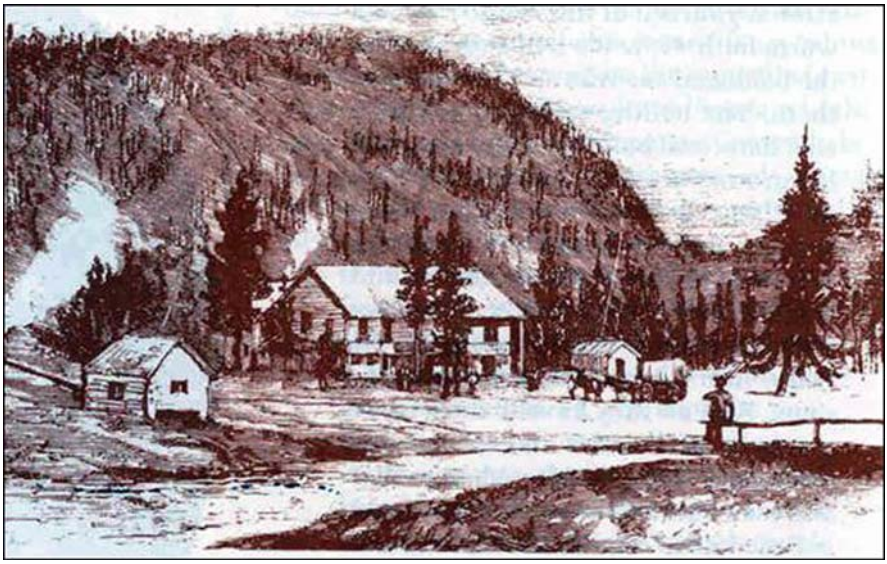

Fig. 3.7 Henderson and Klamer's Firehole Hotel as sketched by visitor Thomas H. Thomas in 1884 (Courtesy Yellowstone National Park archives, MWAC)

Fig. 3.8 George and Sarah Marshall (Courtesy of Yellowstone National Park archives, YELL 36826, 36828)

1876, where he operated a stage line between Eagle Rock and Butte City (Marshall 1885).

In 1879, Marshall was hired to carry mail between Virginia City and Mammoth Hot Springs, Yellowstone. The route was discontinued after one year. The route Marshall served went by Henry's Lake, thus, Marshall often traveled through the geyser basins. Marshall observed, "...it would be a good location for a hotel. I

moved in the park, [and] built a cabin" (Marshall 1885:3). He chose a location just west of the forks of the Firehole River, close to the river's confluence with Nez Perce Creek (Haines 1996c:254). Marshall took on John B. Goff as a partner, and in 1880 they built a shingle roofed mail station, hotel, barn, and outbuildings at a cost of $1,000.00 (Whittlesey 1980:44).

Marshall, his wife Sarah, and their children spent the winter of 1880–1881 in the unfinished hotel. A local paper wrote that Marshall ". . .was the first who with his family spent the winters among the geysers" (*Livingstone Enterprise* [LE] 10 January 1885:2). On January 31, 1881, Sarah gave birth to her fourth child, Rosa Park Marshall, the first white child born in the park (Haines 1996c:175).

The hotel was the Yellowstone terminus for the "Marshall and Goff Stage Company" line from Virginia City, Montana (Haines 1996c:173). The first passengers were Robert and Carrie Adell Strahorn. When Robert Strahorn was hired by the Union Pacific Railroad to explore and publicize the West, he accepted the position providing his wife could accompany him. The couple traveled extensively for thirty years, but their one visit to Marshall's Hotel occurred just three years after their 1877 marriage (Strahorn 1988 [1911], 1:vii–x).

Marshall left Virginia City with the Strahorns in his stagecoach on October 1, 1880. Many warned the couple not to travel so late in the year, but the Strahorns were determined to see Yellowstone. The Strahorns and Marshall spent a grim night in the hayloft of a windowless house near Henry's Lake, and then continued on to the Lower Geyser Basin the next morning (Strahorn 1988 [1911], 1:258). The party reached the Marshall Hotel as night fell on the second evening. The next morning, Mrs. Strahorn found that the Marshall Hotel was not quite what she expected:

> The log house was far from being finished, and the part we occupied was partitioned off with a canvas wagon cover. The second floor was only partly laid, and a window or two was missing in the upper part while the unfilled chinks between the logs allowed the rigorous October breezes to fan us at will. At that time the office and sitting-room and dining-room were one, and a single stove did its best toward heating the whole house (Strahorn 1988 [1911], 1:259).

The Strahorns enjoyed a memorable visit, covering 400 miles (643.73 km) of Yellowstone on horseback. Apparently, Marshall was an excellent tour guide and provided good service despite occasional mishaps. At one point, their horses were lost for several hours and rations were sometimes scarce. Still, the party made the best of limited supplies and difficult late-season conditions while visiting many of the park's notable features (Strahorn 1988 [1911], 1:286). Literature published by the Strahorns after their journey, *Fifteen Thousand Miles by Stage* (1911), provides excellent accounts of early Yellowstone tourism and Marshall's first attempt as a tour guide and hotel owner.

In 1880, tourist facilities were primitive; roads connecting park features were barely passable. Carrie Strahorn described the hazardous conditions on the road connecting Marshall's Hotel with Mammoth Hot Springs. The party began the trip in a light wagon but went back for riding horses when it became clear a wagon would not make the journey:

> There are no adjectives in our language that can properly define the public highway that was cut through heavy timber over rolling ground, with stumps left from two to twenty inches above ground, and instead of grading around a hill it went straight to the top on one side and straight down the other. . . . We had to abandon the light wagon and returned for a new start on horseback, for it was impossible to get any conveyance over the stumpy road . . . it was the only attempt at a road in the park, and what had been done with government funds was pretty hard to see. . . . It was a trip in marked contrast to the beautiful roads and well-equipped stages and good hotels of today (Strahorn 1988[1911], 1:268).

In 1883, the extension of the railroad line to Livingston, Montana, made Yellowstone National Park more accessible; roads and tourist facilities also received improvements. Strahorn's account is an insightful window into Yellowstone travel before improvements were made. Although roads improved steadily under the command of Army Corps of Engineers Captain Hiram Chittenden, during the Strahorn's visit travel was still uncomfortable and even dangerous.

Secretary of State Carl Shurz also visited Yellowstone in the fall of 1880 and promised to help Marshall get a lease for his hotel after spending a rainy night under the stars. Marshall later wrote that Shurz ". . .told me next morning I would have given $20.00 to have got into a house last night and suggested that I should prepare to keep travelers said he would see that I got a permit from the Government" (Marshall 1885:3).

The Marshall Hotel or Marshall's House, the first interior hotel concession granted in Yellowstone, enjoyed steady business during its first full season in 1881. Guests included Wyoming's governor, John W. Hoyt, and future President, Benjamin Harrison (Whittlesey 1980:45). Another 1881 visitor, H. Bernard Leckler, published an account of his visit in *The American Field* (1884). Leckler enjoyed his stay at the Marshall Hotel and described a simple, welcoming hostel:

> Mrs. Marshall prepared a nice supper for us upon our arrival, and I'm sure we did justice to it; the milk and cream receiving our special attention, as it was most excellent. . . Mrs. Marshall was very kind; cooking the dishes we liked best, opening cans of our favorite fruit, and in every way trying to make our stay with her as pleasant as possible. Mr. Marshall was also most agreeable, and did everything in his power for our accommodation. . . Conversation was as animated as upon the previous evening, and the hum of voices filled the apartment, everyone feeling at home and at perfect ease in regular Western frontier style-one man as good as another, whether hostler or millionaire (Leckler 1884:141).

In 1881, the Marshall Hotel was a two-story log house with an extension. The structure had six rooms but only two were used for guests. The remaining four rooms provided a communal lounge, dining room, kitchen, and living quarters for the Marshall family (Whittlesey 1980:46).

It was not an easy life for the Marshall Family. Despite brisk business at the hotel in 1880–1881, Marshall recalled, "My first year here I did not make anything, second year came out $180.00 in debt" (Marshall 1885:4). Marshall was forced to leave his family for a thirty-day business trip to Omaha in June 1881. He left a store of meat in a root cellar close to the house to sustain his family in his absence. Soon after Marshall departed, two bears arrived and, smelling the meat within, began to dig through the roof of the root cellar. Sarah Marshall shot the bears to avoid losing food meant for her and the four children. Marshall later described his wife's actions:

> Wife saw [that] it was either kill bears or starve. She took rifle [and] shot one bear through its lungs, he came rolling toward her, she ran in cabin and closed [the] door just in time, as [a] bear threw himself against it, shaking [the] whole house. He found it useless however, and went off. Wife followed him up the mountain [and] found him breathing hard [and] shot him through the heart. Weighed 700 lbs (Marshall 1885:5–6).

Mary Bradshaw Richards, a New York City resident, visited the park with her husband, and stayed at the Marshall Hotel during the summer of 1882. She observed, ". . .a small story and half hewn log house. . . . A few rough sheds and a tent adjacent formed the settlement, lying at the base of a steep cliff covered with tall pines. A brook of cold water coursed near the buildings" (Richards 1994:29). The exhausted travelers found simple accommodations, but enjoyed deer steak, potted chicken and fried ham and fell into ". . .dreamless and refreshing sleep" (Richards 1994:30).

Further details about Marshall's hotel appear in a letter written by Mrs. Foster, another guest that season in 1882. Her letter tells of the disordered appearance of Mrs. Marshall on washing day, a spectacle that apparently took away Mrs. Foster's appetite. Washing was done across the Firehole River, in a small log house, divided down the center by a partition. Foster's important description notes the peculiar advantages of washing clothes in geothermal waters, "Mrs. M. says she uses but *little* soap, and the worst soiled clothes require hardly any rubbing. . . . She does not have to boil her clothes *at all*, only lets them soak for a few moments. And the water is not so hot as to require cold water put into it" (Whittlesey 1980:47). Guests and residents washed clothes and their bodies in the geothermal waters that flowed to a bathhouse built near the hotel. The high chloride content and temperature of the water helped clean both. Clothes, however, allowed to soak for too long were damaged.

Margaret Andrews Cruikshank, a Minneapolis schoolteacher, visited the Park in 1883. At Marshall's Hotel, she had little patience for inefficiency imposed by limited facilities and rugged wilderness surroundings, and dismissed her hosts for lack of forethought and bad service. She was disappointed by her stay at the Marshall Hotel and noted, "[When] only rough teamsters and hunters visited the Park I suppose he [Marshall] gave satisfaction. . . . But now that crowds throng there and [are] of more fastidious sort Marshall won't do. Marshall must go" (Cruikshank 1989:9).

Cruikshank expressed the general opinion held by many Victorian tourists who visited Yellowstone expecting the grandeur advertised by the Northern Pacific Railroad (NPR) and its competitors (Fig. 3.9). When the NPR completed its park branch line in 1883, they spared no expense advertising the spectacles of "Wonderland" to the public. With the whistle of the locomotive engine, the arrival of the railroad changed the nature and expectations of tourists to Yellowstone National Park. In the 1860s and 1870s a few hardy adventures, the extremely wealthy, and a handful of journalists made the long trip to the northern west, but for a typical tourist the journey to Yellowstone Park before the railroad was too demanding and time consuming (Schwantes 2001:131). Yet it was clear to all parties interested in promoting Yellowstone Park that the future of the West's "grand experiment" hinged upon tourism.

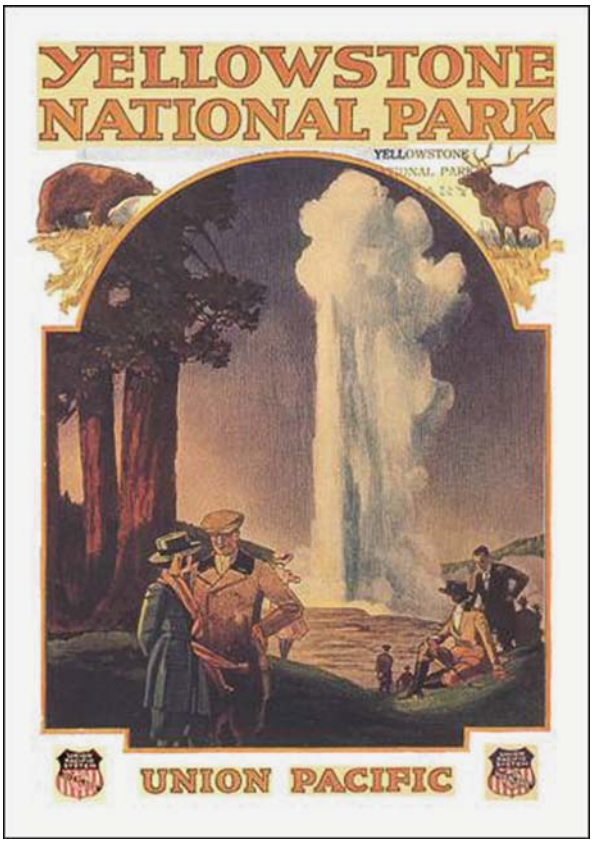

Fig. 3.9 Union Pacific Railroad advertisement placard (Courtesy Yellowstone National Park archives, MWAC)

By virtue of being first on the scene, the NPR would be the greatest promoter of the park. One of the company's primary objectives was to see that, "Yellowstone Park must be made a summer resort" (NPR Company Files, President, 209A, n.d.; Haines 1977a:30–31). With this in mind, the NPR began an unprecedented public relations campaign. Unlike the early steamboat and stagecoach enterprises, the railroad barons promoted *tourism* as the primary reason for any journey. Both the transcontinental railroad, as well as some regional carriers, funded elaborate and complex advertising campaigns hoping to sell the "West" to prospective tourists and settlers (Schwantes 2001:134). By 1886, the competing Union Pacific Railroad had issued a booklet called *Inter-Mountain Resorts* highlighting Yellowstone Park among its pastime destinations. For park visitors the railroad promised a ". . .chance to ponder curiosities of nature or society or the opportunity to improve physical and mental health" (Schwantes 2001:133). The latter two represented the strongest persuasion for tourists of the late-19th-century West. For the railroad barons of the

northwest, the tourist trade would become a primary stake in their business ventures – Yellowstone Park was no exception.

Although railroad promotional materials advertised a breathtaking landscape, the tourist accommodations and roads were still very primitive. During the 1880s and 1890s, Yellowstone superintendents received many complaints concerning hotels and roads (Hyde 1990:250). Travelers "of a more fastidious sort" such as Cruikshank, were not accustomed to the rustic lodging offered by Marshall and his wife. These tourists expected facilities similar to those found at more established Eastern resorts. Wealthy tourists on the *Grand Tour* of Yellowstone endured the Marshall Hotel only until finer facilities were built in the Lower Geyser Basin by the Yellowstone Park Improvement Company (YPIC).

Marshall accommodated as many guests as possible in a limited space. Visitors who did not wish to sleep in tents or under the stars had no choice but to accept what was offered. Cruikshank reluctantly slept in the loft that was divided into compartments by burlap partitions. She wrote, "Judging by their size I [thought] that there must have been more than a half dozen of these little cubby holes, dark [and] stifling! Into these . . . most of us were stowed. Beyond beds, the [less] said about our accommodations the better" (Cruikshank 1989:12).

The summer of 1883 brought many important and affluent guests to the park, but finding no alternative to the Marshall Hotel, most were forced to endure its primitive accommodations. Rufus Hatch, financier for the YPIC, was furious at the competition Marshall posed. Hatch was outraged by a $97.00 bill presented to his party's one night stay at the Marshall Hotel. Hatch stated that Marshall signed his own death warrant with that bill and pledged to erect a tent camp nearby to take away his business (Magoc 1999:67).

Marshall had more to offer his guests than just accommodations. Marshall's extensive knowledge of the geyser basins made him a capable and popular tour guide. G. L. Henderson, a former assistant superintendent and a fellow concessioner in the park, accompanied Marshall on a tour and wrote in the *Livingston Enterprise*:

> I ought to state that Mr. Marshall is an enthusiast on all matters relating to the Park and its innumerable objects of interest. . . I now understand one of the secrets of his popularity with the tourists. He knows where everything of interest is to be found without loss of time. He adds to the enchantment of these wonders by the earnestness of his admiration and the eagerness with which he seeks to enthuse others (Henderson in *LE,* 6 December 1884:1).

Marshall was an early protector of sensitive park features and wildlife. He was careful to keep certain areas secret from tourists to protect them from damage. Generally, Yellowstone's geothermal features were not protected until 1886 when army management ensured that rules and regulations were respected within park boundaries. Marshall protected Yellowstone's features as best he could without army help in the early 1880s. G. L. Henderson (not to be confused with G. G. Henderson, Marshall's second business partner) wrote that Marshall:

> has also the good sense to keep the most beautiful nooks and basins hidden from vandal and specimen fiend who is continually seeking that he might destroy. . . The Microcosm Basin has been so seldom visited that it has escaped mutilation. Mr. Marshall has carefully

> concealed its existence from the ordinary pleasure seekers who are so apt to poke sticks into everything from mere wantonness or curiosity (Henderson in *LE,* 6 December 1884:1).

G. L. Henderson was clearly influenced by Marshall during their time together, and emphasized the great need for conserving and protecting Yellowstone's fragile features. The article concluded with a recommendation that the Microcosm Basin should be enclosed. Visitors should be admitted only when unarmed and accompanied by a careful guide. Henderson further recommended that walkways be laid down so that tourists could not walk on the natural features (Henderson in *LE* 6 December 1884:1).

Marshall recognized the need to improve and expand his hotel by the end of the exhausting 1883 season. He traveled east in early 1884 to make necessary arrangements for a larger hotel and replace his permit with a long-term lease. Marshall received a new government lease on January 29, 1884, obtaining permission to build another hotel at the same location (Fig. 3.2). Marshall took George G. Henderson as a new partner, and chose a new site across the Firehole River (a plot close to the modern Nez Perce picnic area).

Mr. W. Hallett Phillips, a special agent appointed by Secretary of the Interior H. L. Muldrow, reported that Marshall never received permission to build on the adjacent site, "Marshall never attempted to build on the land leased by him. All the buildings erected are situated on the opposite side of the river." Additionally, Philips described the new facilities as, "a very unsatisfactory hotel and some cabins. . ." (Phillips 1886:12). Lack of government approval did not deter Marshall and Henderson from building the new hotel that accommodated 75 guests (Whittlesey 1980:48).

When Marshall retired from the hotel business in May 1885, the partnership of Marshall and G. G. Henderson was officially dissolved (*LE* 23 May 1885:3). Marshall sold out to his partner and moved his family to Bozeman, Montana, where they lived for the next seventeen years (Whittlesey 1980:49).

G. G. Henderson, on the other hand, began further expansion of his enterprise in the park almost immediately. In early June, he left to obtain supplies, ". . .for his men who are at work building more cottages for accommodation of an ever increasing travel to the National Park" (*LE* 13 June 1885). In the same month, Henderson took on Henry Klamer as a partner and officially changed the hotel's name to the Firehole Hotel (*LE* 20 June 1885). The new partners quickly built cottages and doubled the hotel's capacity (Fig. 3.2) (Whittlesey 1980:49). They also applied to have Marshall's old lease altered to include the new hotel building area. The haste to expand proved to be at the expense of the hotel's appearance. Assistant Superintendent Weimer called the new buildings, ". . .a shock and disgrace to the park" (Whittlesey 1980:49).

The partnership of G. G. Henderson and Klamer was short-lived, and the Firehole Hotel changed ownership yet again. By 1886, the Firehole Hotel was owned by the Yellowstone Park Association (YPA). The military superintendent, Captain Moses Harris, expressed confusion as to how YPA acquired the property. Harris suspected that several sales and lease transfers occurred without the knowledge or consent of the Department of the Interior (Harris 1886:10). In a letter written to the Secretary

of the Interior dated July 27, 1891, G. L. Henderson wrote, "On May 1st 1885 the Yellowstone Park Assoc. purchased the buildings and franchises of Marshall and Henderson. This lease evidently includes the land formerly leased to Mr. Marshall" (Henderson 1891:1). Harris's 1886 report confirms that the Firehole Hotel was in the hands of the YPA, but it is still a matter of debate as to how they obtained it.

Confused and angered by the uncertainty surrounding the hotel's lease, Captain Harris was further perplexed by the collection of structures that made up the hotel. His reports annually criticized the Firehole Hotel as, ". . .needlessly ugly in design [with] little privacy for guests" (Harris 1886:10–11). The hotel walls were thin, and doors sometimes refused to shut. Miss. O.S.T. Drake, a guest in 1887, observed that, "every snore was audible" (Drake in Whittlesey 1980:50). Nevertheless, for some visitors, the rusticity of the Firehole Hotel was a perfect complement to the rugged wilderness surrounding Yellowstone. Charles Stoddard was a guest during this time, and "found it good," appreciating the unpretentious buildings, wholesome food, and obliging landlord (Stoddard in Whittlesey 1980:5). Instead of criticizing the primitive lodging found at the Firehole Hotel, Stoddard enjoyed the experience:

> What fun it was, lying there under plenty of covering for the nights are stinging cold all summer long, looking up at the low canvas ceiling, the plaster-filled chinks in the walls, the one wee window with its small pane of glass, the white curtain strung across it. . . There's a bath-house at the Firehole and plenty of fresh air; and at this point trails branch, and tourists congregate, and charge for the whole is only $4 a day (Stoddard in Whittlesey 1980:50).

The contrasting opinions expressed by guests who lodged at the Firehole Hotel are reflections of Yellowstone tourism in the 1880s – a tourism in great transition. Construction of luxurious National Hotel facilities in Mammoth began in 1883 and was well publicized by the Northern Pacific Railroad (Haines 1977a:270, 272). The railroad made Yellowstone accessible, but many visitors who could afford the journey did not expect the ruggedness they encountered in the park interior. Until construction of the Fountain Hotel in 1891, there were no alternatives to the Marshall/Firehole Hotel near the Lower Geyser Basin. Guests who began park tours at the Mammoth Hot Springs Hotel were often shocked and dismayed to encounter the primitive conditions at the Marshall/Firehole Hotel.

During the winter of 1888–1889, E. C. Culver served as winter caretaker at the Firehole Hotel, and lived there with his wife Mattie and daughter Theda. Mattie Culver was tubercular and Culver hoped the mountain air would help improve his wife's health. Sadly, Mattie continued to worsen, dying on March 2, 1889. Heavy snows and frozen ground made proper burial impossible. Soldiers from the nearby Fountain Soldier Station helped place Mattie's body in two barrels covered with snow. She remained there until properly laid to rest when the ground thawed in the spring. A tombstone marking her grave near the present Nez Perce Picnic Area reads, "MATTIE S./Wife of E. C. CULVER/DIED/March 2, 1889/AGED 30 YEARS" (Fig. 3.10) (Haines 1996c:175–176).

By 1889, the YPA chose to construct a new hotel three miles to the southeast. Captain Harris suggested the need for a new hotel in 1887, when he reported, "The hotel at Lower Geyser Basin is located fully a mile from the geysers and greatly

Fig. 3.10 Headstone for Mattie Culver, wife of hotel caretaker E.C. Culver, who died at the hotel in the winter of 1888–1889 (Courtesy of the PAST Foundation © 2001)

inconveniences travelers. Inquiries should be made as to whether more suitable ground cannot be secured for a hotel there" (Whittlesey 1980:51). The National Hotel at Mammoth Hot Springs had been operating for several years by 1887, and the Marshall/Firehole Hotel could not compare with those new accommodations. Construction of the luxurious Fountain Hotel in the Lower Geyser Basin commenced in 1890. The YPA spent $100,000 on the new hotel, which featured steam heat, electric lights, and baths supplied with hot spring water. The Fountain Hotel was closer to popular thermal features such as the Fountain geyser area (Haines 1977b:116). The old and new hotels could not have been more different. The Fountain Hotel was lavish and formal and hosted many balls. The rustic Marshall/Firehole Hotel, reflecting the simple nature of earlier wilderness hostelry, was replaced by a grand-scale hotel, a transition that mirrored changes in the park during its first two decades.

By 1891, the YPA no longer housed guests in the older Marshall/Firehole Hotel. Unless visitors chose to stay in tent camps, or set up camp independently, they were no longer housed in rustic accommodation. The unpretentious, countrified building described by Charles Stoddard, complete with canvas ceiling and plaster-filled chinks in the wall, was no longer needed in a Yellowstone that aimed to satisfy tourists accustomed to luxury. In a letter dated August 18, 1891, Charles Gibson (President of YPA) wrote to Superintendent George Smith Anderson, "All of our buildings at Firehole are now vacant. You are welcome to the use and occupation of them. . . You are hereby authorized to take possession of them at any time. We will charge you no rent and will not under any circumstances hold you responsible for any damages" (Gibson 1891:1–2).

In 1890, the Secretary of the Interior demanded that the Firehole Hotel buildings be removed. The older buildings were deliberately burned in 1891, but the newer cottages were left standing. The secretary was adamant that the YPA's new lease for the Fountain Hotel site would not be honored until the Firehole buildings were gone (Chandler 1891). In 1892, the YPA again offered Superintendent Anderson the Firehole Hotel buildings to house troops, ". . .the Yellowstone Park Association, grant[s] you the free use of our buildings at the Lower Geyser Basin, for the Officers of the United States Army stationed in the Yellowstone National Park" (Pearce 1891). A 1909 map (Fig. 3.11) shows buildings still standing at the Marshall/Firehole Hotel site marked as the "old hotel." No buildings remain on the site today, but artifacts scatters and outbuilding foundations serve as a reminder of early hostelry in Yellowstone and the beginnings of the first national park.

Archeological Investigations

Although the location for the Marshall/Firehole Hotel was generally known by park personnel, the archeological site associated with the Marshall/Firehole Hotel was not identified until a 1992 site inventory by Midwest Archeological Center (MWAC) archeologists Ralph Hartley and Bruce Jones (Hartley et al. 1993). This project was a preliminary survey responding to a portion of the Yellowstone National Park's parkwide road improvement plan that focused on reconstruction of the Grand Loop Road segment between Biscuit Basin and Madison Junction. The hotel site occurred within an alternative road corridor that connected the Grand Loop Road to the Fountain Flats Drive/Freight Road at a point just south of Hygeia hot spring. Although the location was reported to have been a parking lot in the 1940s (Dorwin 1992), Yellowstone's Cultural Resources Division had not been able to confirm this.

It was obvious that the hotel site had historic significance and the initial site visit made it clear that at least some of its components (e.g., bathhouse, grave site) remained intact. The extent of the site and its overall integrity, however, remained to be determined. For this reason, MWAC recommended detailed archeological documentation of the site to assess the site's extent, content, and integrity. This docu-

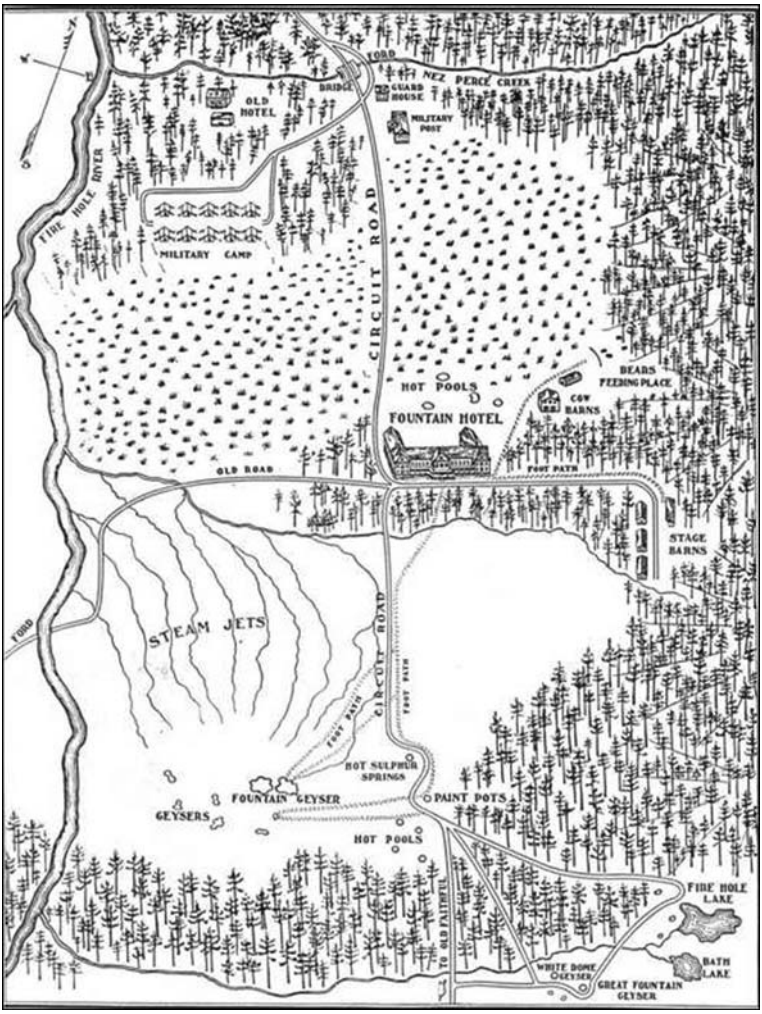

Fig. 3.11 1909 map showing buildings (Courtesy Yellowstone National Park archives)

mentation would include an archeological inventory, subsurface testing, and archival research.

This work was undertaken in 1993 by MWAC Archeologist William J. Hunt, Jr. (1993a), incorporated 133 shovel tests were in a 10 m (33 ft) interval grid over much of the site with an additional 25 tests placed at 5 m (16.4 ft) intervals over depressions and cultural material concentrations (Fig. 3.12).

Instead of a single component site, the 1993 inventory found the Marshall/Firehole Hotel site to be a multicomponent occupation composed of a prehistoric lithic scatter and a scatter of historic debris and features. A single projectile point recovered from the surface near the west margin of the barrow pit is similar

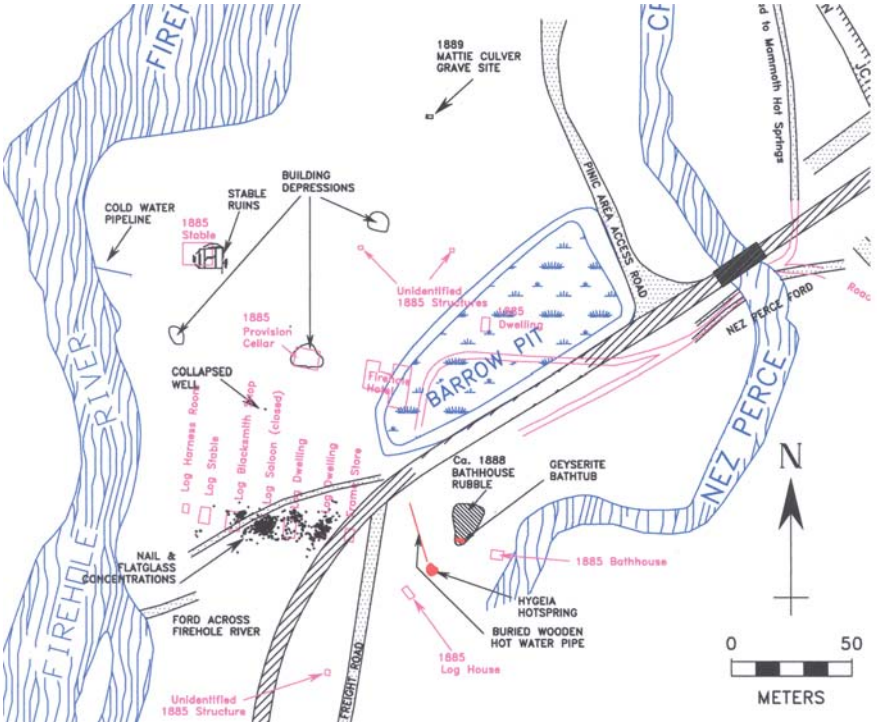

Fig. 3.12 Overlaying the archeological feature map (*black*) with the 1885 historic map (*magenta*) demonstrates relationships between archeological and historic hotel structures (Courtesy of William J. Hunt, Jr. © 2001)

in form to points recovered in the Early Plains Archaic components of Lookingbill and Medicine Lodge Creek sites (Frison 1991:Figs. 2.45 and 2.46). The Early Plains Archaic roughly equates with Greiser's Early Middle Prehistoric period which dates to ca. 5,500–2,500 B.C.E. (Greiser 1984:38). The broadly dispersed obsidian and chert scatter was observed to be similar in content to a site (48YE76) north of the Grand Loop Road. Shovel tests demonstrated the prehistoric cultural material restricted to a 40 m (131 ft) wide area bordering a historic barrow pit and extending to at least 50 cm (20 in.) below the ground surface. The prehistoric component was determined to encompass an area 120 m (394 ft) northeast-southwest by 43 m (141 ft) northwest–southeast (approximate area = 4,067 m^2/43,800 ft^2).

The historic component of the site was difficult to see. Surface artifacts were widely scattered and included objects such as a spoon, flat (window) glass concentrations, curved (bottle) glass, whiteware sherds, and nails. The shovel tests generally yielded cultural material to a depth of 40 cm (16 in.) below the ground surface and sterile subsoils were not reached at –60 cm (24 in.) in two depressions. Objects recovered during shovel testing include: 94 wire nails, 22 cut nails, 67 clear, 4 amber, 12 purple, 2 green curved glass, 42 flat glass, 1 cartridge case, 11 whiteware

sherds, 6 wood fragments, 1 screw, 1 snap, 1 tack, and 44 miscellaneous metal fragments. Altogether, the site area was determined to incorporate an area 374 m (1,230 ft) north–south by 310 m (1,020 ft) east–west (approximately 52,680 m^2/567,000 ft^2).

A relatively large number of features were identified despite the fact that they were often vague in outline and hard to recognize. These include four structural depressions, a well filled with river cobbles, wooden joists and foundations of a structure, fence posts, a cold water pipeline, a partially buried concentration of bricks (piers or fallen chimney?), a hand-dug geyserite bathtub (Fig. 3.13), a wooden hot water pipe extending from the mouth of Hygeia hot spring toward the former hotel location, a concentration of building rubble near Hygeia hot spring, an artifact concentration in the Firehole River, fords across the Nez Perce Creek and the Firehole River, and the grave.

Fig. 3.13 Recording the geyserite bathtub at Hygeia hot spring (Courtesy of the PAST Foundation © 2001)

One shovel test was placed into a rectangular depression later identified as the hotel's provisions cellar. This test was excavated in 10 cm (4 in.) levels. Little was encountered in this test until excavators reached 20–30 cm (8–12 in.) below the surface at which point large pieces of charcoal and a fork were encountered. Charcoal and unburned wood were present to –50 cm (20 in.) suggesting the continued existence of structural elements in this feature. Due to the difficulty of digging these sandy soils below this point, excavation was halted at the base of this level.

Several site features were identified using an 1885 site map (Fig. 3.14) and an 1885 photograph (Fig. 3.2) of the site. The building rubble and in-ground bathtub

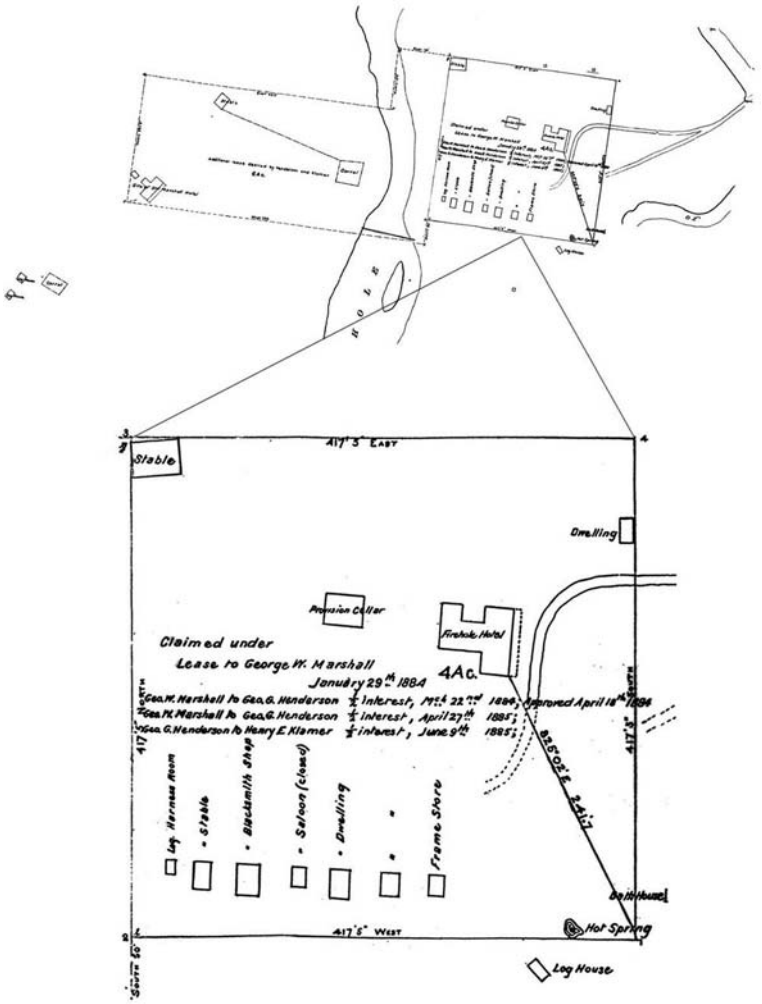

Fig. 3.14 1885 site map with expanded view of Marshall/Firehole Hotel location used to identify historic features (see Fig.3.16) (Courtesy of the National Park Service with modification by William J. Hunt, Jr. © 2001)

at the hot spring correlated with the location of a bathhouse structure in the 1888 photograph. This photograph also shows the ford over Nez Perce Creek. Other structures are visible in the photograph but details were not sufficient to allow correlation with site features.

Although the 1885 map was not acquired until after the field season had ended, it proved very useful for identification of former structure locations especially when archeological mapping data was superimposed over a to-scale version of the historic map. It demonstrated that the barrow pit next to the Fountain Freight Road had

removed the site of one dwelling and a substantial portion of the hotel structure (see Fig. 3.7). Prior to the archeological survey, it was assumed that all remnants of the hotel structure were destroyed during the excavation of a large barrow pit in the northeast corner of the site (probably for road construction at the turn of the 20th century). A large depression at the center of the site was determined to be remains of the hotel's provision cellar. A building outline, floor joists, and large posts on the ground surface near the river correlated with the location of a stable. There were also a number of features with no counterpart on the 1885 map. This led Hunt to suggest they represent site structures built after that date. Brick rubble and other artifacts near the in-ground bathtub were suggested to be associated with a two-story bathhouse that was in place on the site by 1888. The map also identified a row of structures on the south side of the site that lay beyond the shovel-tested area and was not investigated until the following year.

In 1994, Hunt returned to the Marshall/Firehole Hotel site (48YE773) to test one of the site's depressions and to complete documentation of the artifact scatter south of the shovel tested portion of the site. A 1 × 2 m (3.3 × 6.6 ft) test pit was placed in Depression 4 near its southern margin. That feature, located at the north end of the site, did not correlate with the known structures illustrated on the 1885 map. Nevertheless, its size and shape led Hunt to assume it to represent the remains of a structure of unidentified function. The test resulted in the recovery of a surprisingly massive amount of debris given the relatively small scale of the unit. This included complete and fragmented import beer, champagne, and whiskey bottles; architectural hardware and materials (primarily wood fragments, cut nails, grommets assumed to fix the hotel's canvas interior walls in place, and flat glass); whiteware ceramic fragments; gutta percha; etc. The overwhelming proportion of objects were recovered from the upper 20 cm (8 in.); e.g., about 0.2 m^3 (7 ft^3) of cultural material from only 0.4 m^3 (14 ft^3) of fill. No materials were identified below an ashy layer that terminated at 40 cm (16 in.) below the ground surface where cultural fill interfaced with a very hard layer of geyserite. The cultural deposit appears to have been subjected to burning. The US Army is known to have destroyed the greater portion of the hotel's structures in the early 1890s with the hotel's closure and abandonment.

The second action taken that year focused on a concentration of cut nails at the southern margins of the site. The 1885 map and 1888 photograph of the site indicated this general location contained seven structures of various function. Among these were two log dwellings, a frame store, a log saloon, log blacksmith shop, log stable, and log harness room. All structural materials were flagged and piece-plotted using a Sokkia total station and data collector. Four clusters of flat glass and cut nails were discerned which correlate with the 1885 positions of the log dwellings, blacksmith shop, and saloon. The frame store was apparently destroyed by construction of the Fountain Freight Road. No evidence for the remaining two structures (stable and harness room) was visible on the ground surface.

The broad dispersed and scarce number of prehistoric artifacts suggested that component contained no information about the occupation over and above that already collected. The prehistoric component of 48YE773 was there-

fore recommended not eligible for the National Register of Historic Places (NRHP).

As a result of the 1993 and 1994 assessments, Hunt recommended the site as eligible for nomination to the NRHP. This component is significant under Criterion A because it represents the second tourist lodging facility built in the park interior. The site was also considered significant under Criterion B because of its association with pioneer Yellowstone hotelier George W. Marshall. Finally, the Marshall/Firehole Hotel site's integrity was considered "fair." It had obviously experienced impacts through the excavation of a barrow pit and construction of the Fountain Flats Freight Road through the site, actions that had destroyed the remains of several structures including all or most of the hotel. Archeological inventory of this site has nevertheless demonstrated that most structural features continue to exist and undisturbed subsurface elements are common. The archeological component was found to retain much information about the hotel complex and its place within the park tourism arena. This led to the determination that its research potential was determined good and highly significant under Criterion D. It was largely due to these assessments as well as the probable high expense of mitigation that planners abandoned the alternative plan for routing the Grand Loop Road through the hotel site and along the Fountain Flats Drive/Freight Road. All artifacts and site records were cataloged and are curated at MWAC.

1998 Underwater Assessment

In 1998 Annalies Corbin, conducted a preliminary survey and assessment of the underwater component of the Marshall/Firehole Hotel site identified by Hunt in 1993. During August of 1998, Corbin and a volunteer along with the assistance of park archeologist Ann Johnson, spent a day surveying the extent and variety of the artifact scatter. From this informal survey the following conclusions were drawn regarding the underwater component of the site:

- The artifact assemblage was consistent with material noted during visual surveys of the terrestrial portion of the site in 1993 and 1998. The material consisted of late 19th century historic material.
- The variety of material included but was not limited to: glass, ceramic, bone, wood, metal, leather, and brick.
- Artifacts were scattered over an area encompassing the river between both banks and 91.4 m (300 ft) upstream from the primary hotel site and up to 182.8 m (600 ft) downstream.
- There were 2 primary artifact clusters within the scatter area – both consisted of deeper (0.3–0.61 m) (1–2 ft depth) pockets in the river in which artifacts seemed to lodge as they were tumbled and pushed by the current.
- A large portion of the artifacts were whole or complete including buckets, chamber pots, dishes, bottles, etc.

- Artifact scatter along the riverbank was found "piled up" in a number of locations. Disintegration of the objects was consistent with submerged material that had been allowed to dry without proper conservation. In other words, the material had been collected from the river by vandals (fishermen and visitors) and then left along the shore.

The August 1998 preliminary survey noted sufficient submerged archeological remains in good condition to warrant further investigation. Adjacent to heavily visited picnic grounds and fishing spots, the site was subject to significant damage from visitation to this popular park location. Monitoring alone would not satisfy the public's need to preserve and protect this important historic location; visual obstructions and rugged terrain prevented adequate monitoring of the archeological material. In response to findings of the preliminary surveys and strong indications of future damage, a more complete inventory of the site's underwater archeological component was urgently recommended in order to further document and assess vandalism to the site. Further study of the site's underwater component would allow park managers to: (a) assess the vandalism impact; (b) develop plans for preventing or mitigating vandalism; (c) and to formulate monitoring recommendations.

2000 Material Culture Sampling

Following the 1998 survey, the PAST Foundation, in partnership with NPS-Midwest Archeological Center (MWAC) and Yellowstone National Park, drafted a proposal for a more-detailed inventory in 2000 of the Marshall/Firehole Hotel site's underwater component. Though funding for the 2000 field season was not forthcoming, Corbin, under the auspices of PAST, conducted an unfunded, random sampling of the site's diagnostic underwater material as part of a planned MA thesis project for East Carolina University (ECU) Maritime Studies student, M. J. Harris. The sampling occurred during the course of a single afternoon on June 16, 2000 (Fig. 3.15), and focused on recording a representative sample of the site's material culture, as well as collecting ceramic and glass artifacts with maker's/manufacturer's marks. All collected artifacts were conserved according to NPS standards at ECU's conservation laboratory in Greenville, North Carolina.

One of the more striking revelations of the 2000 sampling exercise was the fact that the material culture deposits noted in 1993/1994 and again in 1998 were drastically reduced. Vandalism to the site over the two-year period had reduced the artifact deposits to mere scatters. Few, if any intact artifacts remained and there were significantly more piles of broken or crushed artifacts along the stream bank.

2001 Site Inventory

After the 2000 sampling, the PAST Foundation in partnership with Yellowstone National Park and MWAC, once again submitted a proposal for inventory and evaluation of the underwater material. With procurement of NPS funds, the

Fig. 3.15 Dr. Annalies Corbin and M.J. Harris discussing artifacts (Courtesy of the PAST Foundation © 2001)

Marshall/Firehole Hotel Underwater Archeology Project was created as a cooperative National Park Service – PAST Foundation venture partially funded through an NPS-Intermountain Region Challenge Cost Share Grant. The survey crew consisted of Annalies Corbin (PI), William J. Hunt, Jr. (Co-PI), M. J. Harris (Field Assistant), and 14 Volunteers-In-Parks (VIPs), most of whom were from the Science Focus Program Lincoln Public Schools, Nebraska. Between August 16 and 25, 2001, the archeological survey crew recorded and collected submerged underwater artifacts contained within a 100 m^2 (1,080 ft^2) area of the Firehole River. With a more comprehensive focus than past preliminary surveys, the 2001 site survey sought to:

- identify the range and locations of archeological resources at the site;
- understand and reconstruct the land use plan of the Marshall Hotel;
- determine apparent functional associations when possible;
- identify past and current park, public, and natural impacts;
- recommend possible interpretation alternatives that incorporate the entire hotel industry;
- provide an educational opportunity for volunteers to participate in historical and underwater archeology; and
- continue the identification and assessment of vandalism's impact across the site.

Artifact scatter along the riverbank was found "piled up" in a number of locations. Disintegration of the objects was consistent with submerged material that had been allowed to dry without proper conservation. Further evidence suggests that cultural material had been collected from the river by vandals.

Material Culture Analysis

The 2000 and 2001 investigations at the Marshall Hotel site documented hundreds of artifacts of a variety of types associated with the Park's tourism industry. With the nation's railroads active solicitation for tourists in the mid-19th century, the nature of Yellowstone Park changed. As travel to and within the park became easier, the number of tourists quickly increased. Accordingly, the quantity, variety, and style of goods needed to satisfy the changing expectations of tourists lured by the charm of picturesque railroad placards increased (Fig. 3.9). The typical coarse earthenwares, which served guests of the early Marshall House and stray picnickers (Fig. 3.16), no longer sufficed in comparison to decorative tableware and finer ceramics of the Firehole Hotel. Therefore, the railroad not only changed the tourist make-up within park, but also brought new, luxurious varieties of food, dishes, and linens that set their tables and make their rooms. Analysis of the material culture assemblage, especially the ceramics and glass therefore, hold valuable insights into consumer goods used and purchased within the confines of Yellowstone's early tourism industry.

Fig. 3.16 Picnicking tourist party ca.1880. Photograph by Bozeman, Montana commercial photographer Henry Bird Calfee (National Parks Service, [as printed in] in Wrobel and Long 2001:212,YELL 8395)

The 2001 site-inventory survey began with the re-establishment of the 1993–1994 archeological grid from a datum at the Marshall/Firehole Hotel site. The grid was extended across the Firehole River and survey flags were set at 5 m

Fig. 3.17 And they're off. Inventory of a transect begins (Courtesy of the PAST Foundation © 2001)

(16.4 ft) intervals. Each flagged grid location served to identify transect corridor boundaries (Fig. 3.17). The transect lines or ropes were marked in 5 m (16.4 ft) intervals creating 5 × 5 m (16.4 × 16.4 ft) units within the transects. Thirty transects were completed during the weeklong site-inventory.

The field crew was divided into two teams with each team working within a single transect from opposite sides of the river moving toward the middle of the transect corridor (Fig. 3.18). Using Plexiglas®-bottomed buckets, scuba masks, and feeling the bottom with their hands, the teams scanned the river bottom for artifacts. One person in each team was the transect data recorder.

As artifacts were encountered, the following information was collected: transect grid location, material type (ceramic, glass, metal, other), type of artifact (i.e., cup) and number of artifacts. Ceramics were further distinguished by material including but not limited to: whiteware, ironstone, china, and stone ware. Glass was specified by type (bottle or flat) and by color including amber, blue, green, brown, amethyst, etc. Given the dynamic nature of the environment no artifact was considered contextual based on location and space. All artifacts in the Firehole River are clearly mobile. Therefore, we opted to grid the site only for the purposes of gathering an accurate count of artifacts by number and type rather than by position and context. Artifact collection/recovery was limited to items:

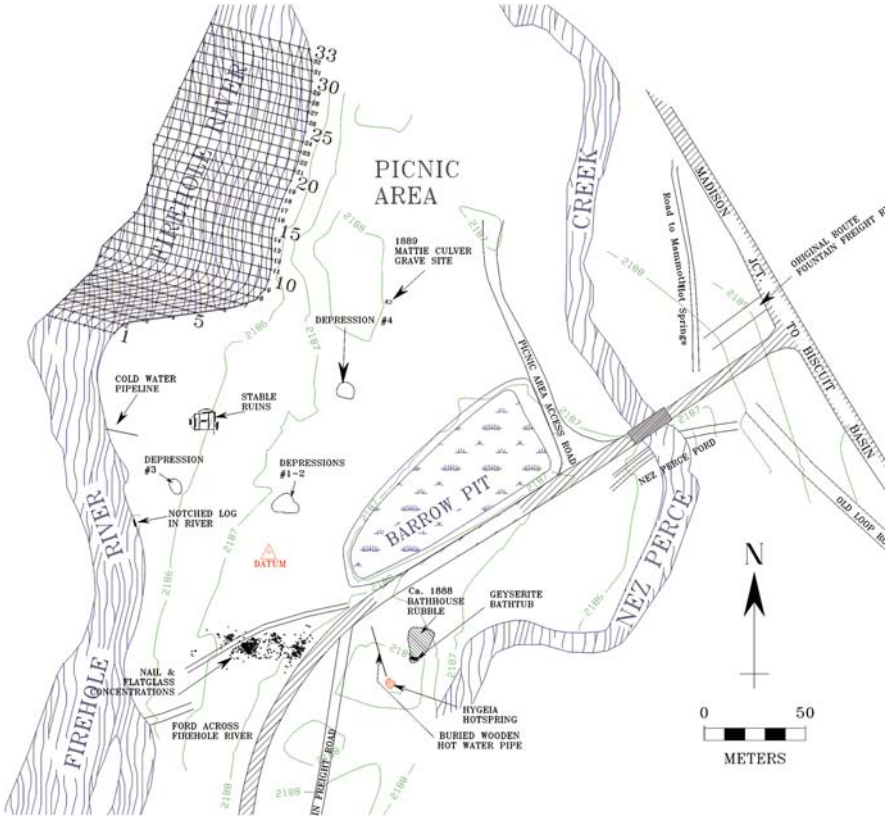

Fig. 3.18 2001 investigations site map (Courtesy of William J. Hunt, Jr. © 2001)

- with clearly discernable makers marks or points of manufacture/origin;
- not previously documented in the site prior to this survey;
- that were of exhibit quality upon post-conservation; and
- composed of material types not gathered in 2000 – a variety of material types from a thermal river environment were necessary for testing conservation methods and procedures.

Archeology in a Thermal River Environment

An unusual aspect of the 2001 Marshall/Firehole Hotel Project is that the fieldwork took place within a thermal river environment. An environment that, when fully understood, creates a unique set of circumstances for artifact preservation. Yellowstone National Park's Firehole River is actually a cold-water stream in its upper drainage, such as above the Upper Geyser Basin. During the course of the river's 27 mile (44 km) journey to its confluence with the Madison River, the stream volume

and mineral content increase dramatically due to the effluent from the Upper, Middle, and Lower Geyser Basins (Woodward et al. 2000:3). The river itself, however, is not a thermal feature. This hydrothermal input from the geyser basins makes for a unique aqueous environment and a rare archeological opportunity within the site of the Marshall Hotel.

Heat, water, and atmospheric pressure are the sustaining ingredients of Yellowstone's hydrothermal features. The combination of a rhyolitic lava base, molten rock reservoir, and a cyclical system that keeps meteoric (rain and snowmelt) water moving, produces heated water containing high levels of dissolved salts and minerals that eventually flow into the Firehole River (Harris 2004). Geothermal chemists A. J. Ellis and W. A. J. Mahon described the outflow of water from Yellowstone's geyser basins into the Firehole River as Type A under their classification system. Although the waters are slightly different from system to system depending on area, rock type, and outflow concentration, Type A water has a high concentration of dissolved salts, usually sodium and potassium chlorides. The pH ranges from slightly acidic to slightly alkaline (pH 5–9) and may contain high concentrations of sulfate, bicarbonate, fluoride, ammonia, arsenic, lithium, rubidium, cesium, and boric acid. This water type usually occurs in areas associated with boiling springs and geyser activity. Examples of this Yellowstone water type exist around the world including Wairakei, New Zealand; Otake, Japan; and Mexicali, Mexico (Ellis and Mahon 1977; Harris 2004).

The Firehole River follows a fault in the rhyolite plateau and receives substantial thermal additions that alter its physical and chemical composition. As the river flows downstream, temperature, pH, and alkalinity all increase substantially. The Firehole River is a good example of a naturally thermally polluted river. Thermal inputs raise the river's water temperature by 27°F (15°C) as it flows through the geyser basins, from 18 to 47°F (10–26°C) (Armitage 1958; Zeikus and Brock 1972; Harris 2004). The Firehole River receives 68 tons (61,700 kg) of minerals every 24 hours from the Upper Geyser Basin alone and contains much larger amounts of chlorine (Cl), fluorine (F), arsenic (As), and tungsten (W), when compared with levels in surface water unaffected by thermal input. These four elements are often found in high levels in geothermal waters (Harris 2004; Miller et al. 1997; Armitage 1958).

The Firehole River and its tributaries, including Nez Perce Creek, receive input from nearby thermal features and hot springs. Allen and Day (1935) defined three types of hot water within park boundaries in 1935. Type 1 are predominately sulfate waters that are either acid or close to neutral. The dominant acid presence is sulfuric acid; chlorides and fluorides are present only in small amounts. Type 1 waters also contain dissolved silica, sodium, potassium, calcium, and magnesium in amounts that vary depending on the area (Allen and Day 1935; Harris 2004).

The type of hot water that joins the Firehole River and flows past the Marshall/Firehole Hotel is an example of an Allen and Day Type 2. This water type is similar to Ellis and Mahon's Type A. There are slight differences because Allen and Day formed their classification system based solely on Yellowstone National Park, while Ellis and Mahon sought to categorize all hydrothermal systems. Type 2 waters are alkaline, and capable of neutralizing acids. Chlorides are present in high

levels and the presence of sulfate is minimal. Silica is another important presence in Type 2 waters. The alkalis are the metals sodium, potassium, and lithium (Allen and Day 1935; Ellis and Mahon 1977; Harris 2004).

Type 3 waters occur least in Yellowstone. This type of water is characterized by high levels of calcium bicarbonate and little silica. Type 1 and Type 2 can occur in the same area which can result in mixing, but generally, one type is dominant. In the case of the Firehole River at its confluence with Nez Perce Creek, the hot water defined by Allen and Day as Type 2 is clearly dominant. This is apparent in chemical analyses of the Firehole River (Allen and Day 1935; Miller et al. 1997; Woodward et al. 2000; Harris 2004).

Understanding the geothermal properties of the Firehole River is crucial when examining cultural material found in and around the river. During the 1998 assessment of the underwater component of the site, a significant quantity of material culture was noted across the site. In addition to the surprising volume of material, artifacts seemed to be well preserved. High quality preservation of objects in submerged freshwater environments is not necessarily unusual; what was remarkable about the artifacts in the Firehole River, however, was the *variety* of well-preserved materials including organics.

The 1998 assessment identified concentrations of ceramics and glass consistent with that observed during the 1993 land survey. In addition, the underwater component contained brick, metals, and organics including leather, rope, wood, and fire debris. The bottom sediment of the Firehole River is not a soft silty bottom which is typical of freshwater sites with a high degree of organic preservation. At first glance, the bottom composition of the Firehole River consists of a highly mobile rocky matrix overlaying a hard rock bottom with patches of sand (Fig. 3.19). Closer scrutiny of the bottom sediment provided several surprises.

The bottom of the Firehole River resembles an old lava flow. There are patches of the bottom that display the thick "flow-like" nature of liquefied rock and sediment. Yet, this "old flow" looks as if it is growing. There is a fair amount of algae and sediment build-up attached to the "old flow." Scattered throughout are numerous imbedded artifacts, often still completely intact. This "old flow" is hard–very hard. Artifacts can often only be removed with the use of a chisel and hammer. Once an object is finally removed from the matrix, one makes an astonishing discovery.

The ceramics and organics all demonstrate typical signs of submersion in alkaline freshwater with a high mineral content – well within the above definition of Allen and Day Type 2 water. For example, ceramics were mineral stained, black and brown/red from the high iron, sodium, and potassium content of the water (Rodgers 1992). Ceramics removed from *within* the "old flow" however, were perfectly clean and preserved. There were no stains and no pitting from mineral exchange. The artifacts removed from within the matrix of "old flow" looked like they were just unpacked from their 19th-century shipping crates. Closer scrutiny of the bottom revealed that many of the rocks and stones scattered across the river are not really rocks and stones, but more of this same mystery material or concretion. Many of these concretions, rather than being attached to the bottom, are loose and have been

Fig. 3.19 The rocky bottom matrix of the Firehole River. Note the embedded artifact (Courtesy of the PAST Foundation © 2001)

tumbled and rounded by the high velocity of the river flow. How many contain artifacts may never be known.

In 2001, concretion samples were collected for analysis. Geologist Nancy Hinman of the University of Montana analyzed the concretion samples and found that they consisted of cemented rhyolite and obsidian sands (Hinman 2002). The sand grains served as the host material on which the cements have accumulated. Hinman found there were three types of "cement" present and within these lies the secret to the preservation quality within the Firehole River.

The first type of cement is a white, fine-grained, amorphous material with small amounts of quartz, feldspar, and clay minerals present. Scanning electron microscopy showed a "dense matrix of silicon-rich cements on which an organic biofilm (Fig. 3.20) has accumulated." Within the biofilm, filamentous bacteria (Fig. 3.21) were detected. The second type of cement is red, fine-grained, amorphous material with feldspar, manganite, and quartz. Chemical analysis also showed abundant silicon, manganese, iron, aluminum, and calcium. Like the first type, the red matrix demonstrated biofilms which "appear to be filamentous bacteria that have created a dense mat (Fig. 3.22). Small diatoms or other aquatic algae are also present. The biological richness of the red concretion material suggests a robust biological community and potentially harbors microorganisms that use the iron and manganese as energy sources" (Hinman 2002). The third type of cement matrix is black, fine-grained, dominantly amorphous material containing silicon, iron, and some aluminum and calcium. It is more iron-rich than the other two types.

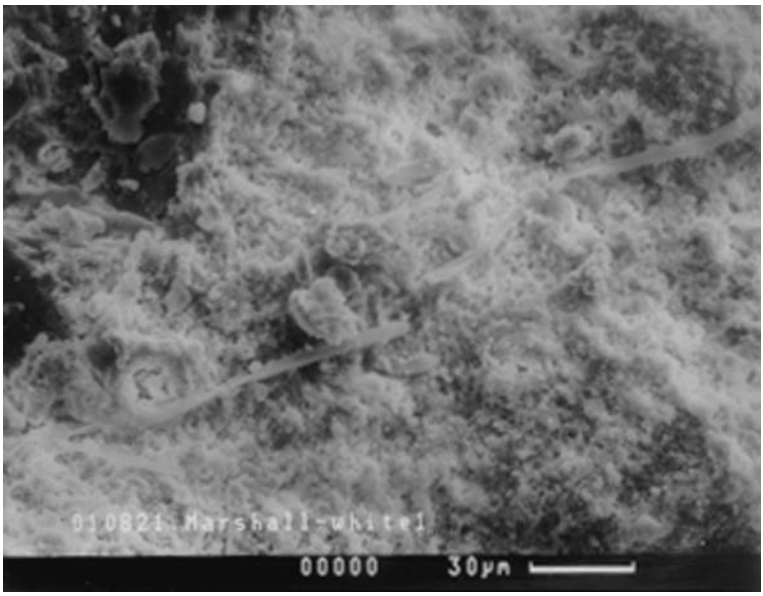

Fig. 3.20 Scanning electron photomicrograph of filamentous bacteria and associated organic biofilm in white concretion material (Courtesy of Nancy Hinman © 2002)

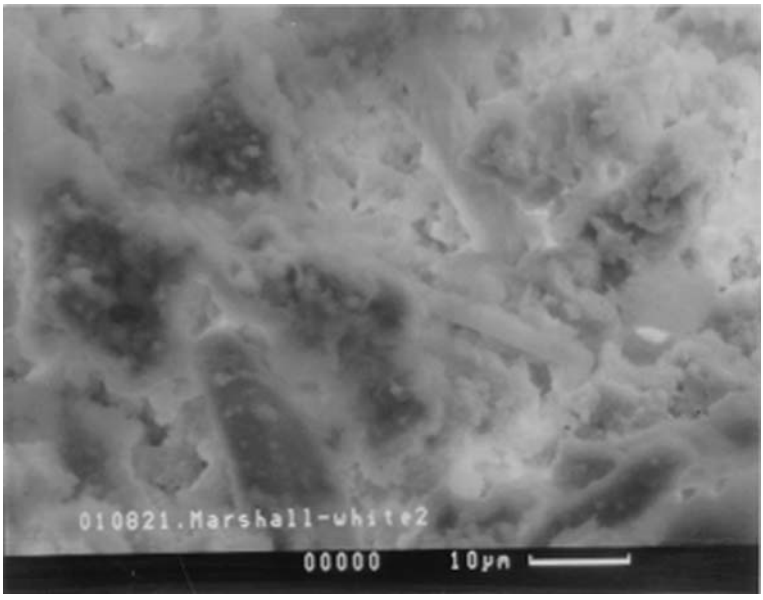

Fig. 3.21 Scanning electron photomicrograph of microbial filaments and possible diatom fragments in red concretion material (Courtesy of Nancy Hinman © 2002)

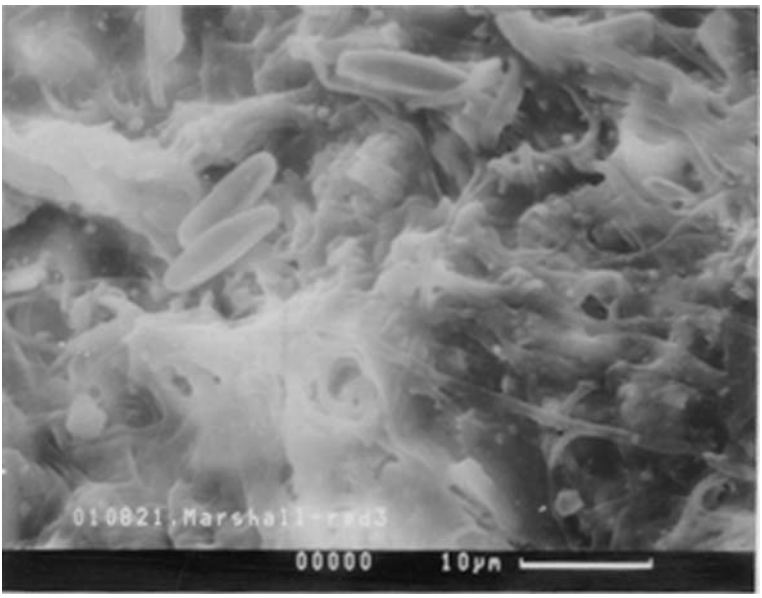

Fig. 3.22 Scanning electron photomicrograph of microbial filaments and possible diatom fragments in red concretion material (Hinman 2002:4)

Hinman's (2002) analysis suggests the concretion/matrix samples constitute an environmental process referred to as *stream-bed armoring* (DeMonge et al. 1998; DeMonge 1999; Gibson 1999; Vitale 2002). She concludes that, "these streambed armoring deposits are known to occur throughout the Firehole drainage. They appear to form in losing stream stretches where dissolved components in surface water precipitate upon contact with slightly different chemical conditions in groundwater. The rates are variable, but can be high. The presence of microbial mats suggests the precipitates are biomediated." With Hinman's analysis lie both the answer to Firehole River mystery and a new archeological problem.

That "old flow" is really concretions; and these concretions are alive! Just as salt-water concretions of calcium carbonate seek out and cover material culture in ocean environments, the Firehole River concretion process is similar. Typical calcium carbonate concretions exchange calcium for iron and other mineral deposits. Anchors and amphora are quickly covered in concretions that, with enough time and the right conditions, will completely absorb/dissolve artifacts with the right mineral composition. In the Firehole River the microbial mats of the armoring concretions are seeking out iron and manganese deposits. Ceramics and glass that have absorbed trace metals from the river (and are thus stained) son become targets for the hungry microbes in the water.

Likewise, this environmental answer explains the number of iron/metal artifacts documented in 2002 that were found completely embedded in the armoring of the river bottom. Presumably, with enough time the iron artifacts would be completely

"eaten away" by the microbial mats. Unfortunately, there is no way of knowing how many artifacts are now encased in these concretions. Unlike many concretions in salt-water environments that typically still resemble the original artifact, the concretions in the Firehole River covered small movable objects and the action of the river has tumbled the concretions (removing any possible archeological context) enough that they often resemble relatively smooth rocks. Identifying mobile concretions with artifact potential by sight alone is impossible as is recognizing sections of bottom armoring with artifact potential.

Ceramics

The vast majority of the site's ceramics are refined earthenwares of the whiteware and ironstone ware varieties, with a few examples of low-grade soft-paste porcelain. Twenty-three ceramic samples were recovered from the Firehole River for further investigation.

Stone china and ironstone wares are similar in appearance and proved popular as strong, inexpensive alternatives to porcelain. By 1851, many US hotels used ironstone china. Increased export of English hotel ware, and the production of hotel wares in the United States, resulted from the demand for inexpensive, mass-produced, strong, and aesthetically pleasing wares. By the 1870s, there was a strong hotel ware industry in England and the United States (Godden 1999:173). During the operational years of the Marshall Hotel site, the ceramic industry in the United States centered in East Liverpool, Ohio, and Trenton, New Jersey. These two competing towns produced nearly half the total ceramic supply for the country (Thistlethwaite 1958:273). As East Liverpool and Trenton competed for the domestic trade, British counterpart manufacturers also found an American market eager for reputable wares. While British potters surpassed the quality and standards of the American potters market, domestic potters took advantage of speed and quantity of production. For most American potters, the majority of which were first or second generation English immigrants, the focus on quantity over high quality proved the greatest technical distinction from similar wares manufactured across the Atlantic. Although the social organization within pottery houses were nearly identically in both countries, but human labor dominated every stage in an English potting house, while American potters sought mechanical advantages such as steam powered clay mixers to reduce production time (Thistlethwaite 1958:272–275). By the 1890s, an American entrepreneur, searching for ceramic tableware must have quickly found two options for his or her purchase – high-quality, expensive foreign-made ceramics or cheaper domestic products of mass quantity.

Of the eight identified maker's marks within the Marshall Hotel ceramic assemblage, five belong to British firms while three belong to American companies. Though the assemblage is too small for statistical analysis, the English to American ratio does parallel the overall complexion of the ceramic trade in the 1890s (Kovel and Kovel 1986). Each of the English potters represented are known to have

focused portions of their product lines to the American market while the American representatives show examples of product lines that either exploited the demand for cheap durable wares or show attempts to mimic higher quality British wares.

The most common mark found on British ceramics at the Marshall Hotel site, is the British Royal Arms insignia, a mark often found on ceramics from the 19th and 20th centuries. The presence of a crown atop a quadrant shield post-dates 1837 (Kovel and Kovel 1986:267). A semi-circular inscription "Royal Ironstone China," further dates the mark to after 1850 when the word "Royal" came into common use (Godden 1999:174). Printed within the shield's rim is an archaic-French inscription, reading *Honi Soit Qui Mal Y Pense*. The English translation reads, "Evil be to him who evil thinks," referring to the English Order of the Garter (Starkey 1991:94). English lore recounts King Edward III founding the order in response to his Norman campaigns during the 14th century, in which he fought for his right to the French Crown (Vale 1982:76–94).

Of the makers who incorporated the royal arms into their mark, three have been identified in the Marshall Hotel site ceramic assemblage. The first potter with a royal arms is J.W. Pankhurst & Co. (Fig. 3.23), found on two ceramics from the Marshall Hotel site (Godden 1999:296; Cushion 1994:275; 1980:139, 175–180). Pankhurst produced a large variety of ironstone stone china from 1850 to 1882 out of Hanley, England, mostly intended for the American market. The company displayed their country's reputation by placing the royal arms above their name (Godden 1964:481, 1999:296). The word "ENGLAND" at the base of the mark often connotes a post-

Fig. 3.23 J.W. Pankhurst mark (Courtesy of the PAST Foundation © 2001)

1880 date, after the 1891 Tariff Act (Godden 1988:34). Since the Pankhurst Company ceased to exist after 1882, this fragment must be an early import to the Marshall/Firehole hotel.

The second potter to display the insignia was Johnson Bros. Ltd., which operated out of Hanley and Tunstall, England, from 1883 to 1968 (Fig. 3.24). This company produced large amounts of ironstone wares intended for both domestic and foreign trade (Cushion 1994:204; Godden 1999: 270). Unique to this piece is the inclusion of the "Pankhurst" name, presumably of J.W. Pankhurst & Co. During the company's history, Pankhurst formed at least two separate partnerships with other potters, James Meakin, and John Dimmock (Godden 1999:296). Though these two potters produced their own wares, the Pankhurst mark never incorporated Meakin's or Dimmock's names (Cushion 1980:139, 175–180, 1994:275; Godden 1999:296). Preliminary research has not discovered an instance in which the Pankhurst name appears with another potter's name (post-1850). "Pankhurst" appearing on a Johnson Bros. mark is not especially curious. Godden (1964:355) notes that Johnson Bros. Ltd. was formerly J.W. Pankhurst & Co. This suggests the mark is transi-

Fig. 3.24 Johnson Bros Ltd. mark (Courtesy of the PAST Foundation © 2001)

tional, dating to the early years of Johnson Bros. Ltd. which was created in 1883 (ibid.).

A third British potter represented by the Marshall site's ceramics, incorporates a crown and ribbon symbol, as opposed to the royal arms. The mark (Fig. 3.25) identifies the manufacturing company as John Maddock & Sons(s) (Ltd.), Burslem, England (Godden 1964:406, 1999:274–275). John Maddock & Sons produced highly durable, utilitarian ceramics from 1855 to 1985. Godden (1964:406) notes that "Ltd." was added to Maddock & Sons' marks after 1896. Lacking this designation, the ceramic should date to pre-1896. Upon returning from a visit to America in 1876, John Maddock focused on producing a wide variety of granite and hotel wares, intended mainly for the growing American market (Godden 1999:275). Maddock used a variety of marks for his wares, each indicative to a specific manufacturing date range (this particular mark reads "MADDOCK & CO."). After 1855, Maddock frequently marked his wares with "Maddock & Son," or "Maddock & Sons Ltd." after 1896 (Godden 1964:406; Cushion 1994:234–235; Godden 1999:275).

Fig. 3.25 Maddock & Co. mark (Courtesy of the PAST Foundation © 2001)

The phrase "TRADE MARK" appearing on this piece, became common British ceramics after 1862, following the British *Trade Mark Act* of that year. As noted earlier, the incorporation of the word "ENGLAND" in the mark suggests a post-1880 date (Godden 1988:34).

Three ceramic artifacts are printed with the maker's mark wares of Knowles, Taylor, & Knowles, East Liverpool, Ohio (Fig. 3.26). This potter began producing ironstone in 1872 and claimed to use the first natural gas kiln. The firm became the largest pottery manufacturer in the United States with 29 kilns producing hotel china like that found in the Firehole River. The eagle trademark was used on ironstone china around 1879 and a variation of that mark was introduced in 1881 (Gates and Ormerod 1982:115–116; Lehner 1988:238–239).

The next American manufacture represented at the Marshall/Firehole Hotel site is the Greenwood Pottery Company, Trenton, New Jersey (1868–1933) (Ramsey 1939:182; Kovel and Kovel 1986:77; Stern 1994:25, 66). This artifact (Fig. 3.27) bearing their mark stands out by being nearly twice the average thickness (0.9 cm/0.35 in.) of the entire assemblage (0.5 cm/1.2 in.). The Greenwood Pottery Company produced a variety of granitewares and porcelain throughout the 19th cen-

Fig. 3.26 Knowles, Taylor, and Knowles mark (Courtesy of the PAST Foundation © 2001)

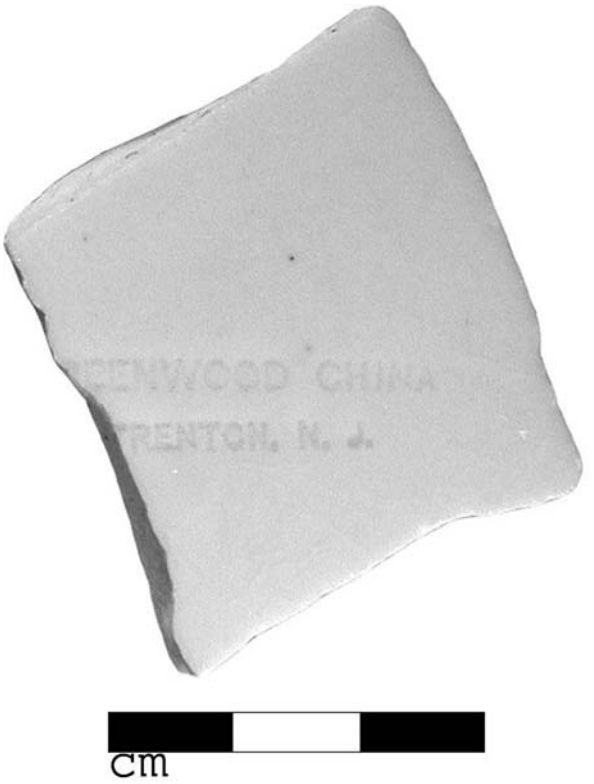

Fig. 3.27 Greenwood Pottery Company mark (Courtesy of the PAST Foundation © 2001)

tury (Ramsey 1939:182; Kovel and Kovel 1986:77). In 1896, the company introduced a new line of wares, dubbed hotel china. Marketing was directed at the boarding house and hotel markets, with exceptionally thick hotel china produced to exploit the hostelry industry's busy summer season. Marc Jeffrey Stern quotes an 1896 description of this ware as "thick enough 'to breed indigestion'" (Crockery and Glass Journal in Stern 1994:25). Lois Lehner indicates the name "Greenwood China" was first impressed on ironstone and white granite in 1886 (Lehner 1988:180). This suggests a ceramic acquisition late in the hotel's history.

The final American potter represents American mimicry of British whitewares. Three diagnostic features suggest Willet's Manufacturing Co., Trenton, New Jersey as the maker: (1) a partial cartouche, based on the royal arms; (2) a blurry style; and (3) the partial letters "M. CO" (Fig. 3.28). A survey of Kovel's and Cushion's lists of maker's marks shows that cartouches primarily appear on British marks, however, Kovel notes that American potters frequently mimicked British marks, often disguising their true origin by blurring the design (Kovel and Kovel 1986:267; Cushion 1994).

Fig. 3.28 Willet's Manufacturing Co. (Courtesy of the PAST Foundation © 2001)

In 1894, Willet's Manufacturing Company was the second largest Trenton ceramics shop, with 11 kilns producing a variety of white granite, semi-porcelain, and porcelain wares from 1879 to 1962 (Kovel and Kovel 1986:14; Stern 1994:259n). Three popular styles of marks, a knot design, a globe, and an imitation royal arms appeared on the company's wares (Ramsey 1939:182). The imitation royal arms, underscored by "W.M. CO," was used from 1879 to 1882 (Kovel and Kovel 1986:14). Though the design on this piece is not a royal arms, the blurred cartouche has a distinctively mimicked-British appearance, for which Willet's had a reputation (Ramsey 1939:182). Also, the mark's lettering matches Willet's style of initialing his wares, providing good support that this artifact belongs to Willet's Manufacturing CO., Trenton, New Jersey.

Glass

Glassware recovered from the 2000 and 2001 inventories of the Marshall/Firehole Hotel site represents at least three distinct demographic groups within the park. Of the 31 glass artifacts collected for further research, 24 pieces are identified in a context relating to activities of the park's first tourists of the late 19th century, 2 pieces are related to later tourists of the mid-20th century. One piece is related to fur-trading activities of the 1840s, leaving 4 unidentified. As a whole, the glassware assemblage represents a shift from the park's early tourists who anticipated east coast luxury in the wild, to tourists who sought domesticity in a wilderness setting. Where the initial tourists, those visiting the hotel, expected concessionaires to cater their wants with fine tablewares and bubbly spirits, the later group of tourists expected park management to provide their transportation needs within the park.

The most important distinction to make, therefore, is that the bulk of the glassware assemblage represents items brought into the park *for* tourists, while the minority represents items brought into the park *by* tourists. By dividing the glassware temporarily, clear distinctions are seen between the relationships of tourists and concessionaires whose role shifts from a noticeable, constant part of visitors' experience, to concessionaires who are a relatively unnoticeable, intermittent part of visitors' time in the park.

Form, function, and diagnostic marks provide the basis for placing individual glass artifacts in a context with either the Marshall/Firehole Hotel or later trends in park tourism. In contrast to the ceramic assemblage, not every glass artifact collected from the site contains manufacturer's mark; however, the site's occupational history allows certain artifacts to be placed in context with the hotel. The most obvious examples are the nine pieces of tableware (Fig. 3.29) that logically arrived on site after years of simple service.

In sites with multiple structures of varying temporal ranges, tableware without manufacturers' marks is often problematic for dating purposes (Jones and Sullivan 1989:17, 24). The brief occupational history of this site's historic structures, however, allows these pieces to be confidently placed in context with the hotel and early park tourism. While the term tableware is loosely applied, since their fragmentary nature does not lead to an exact determination of their forms, their decorative patterns suggest a function of aesthetic purposes. Whether used as drinking glasses, pitchers, or ornamental items, these pieces must have been chosen for style over practicality in the rough environment of Yellowstone Park, and were likely aimed at the expectations of early park tourists who entered the park in commodious railroad cars (Schwantes 2001:137). Tableware on the Marshall/Firehole Hotel site represents the concessionaire's catering to early park tourist's desire for luxury in the wild of Yellowstone Park.

The idea of traveling across America in luxury is a hallmark of late-19th-century tourism, the one constant between the Pullman Pioneers and travelers of the stagecoach/steamboat era is alcoholic beverages. Whether to cope with the jostling of wooden wheels on dirt roads, or the chatter of steam engines, alcohol gave respite to countless travelers before the era of western railroad supremacy (Schwantes

Fig. 3.29 Tableware recovered from 2000 and 2001 inventories (Courtesy of the PAST Foundation © 2001)

2001:128–131). In a similar manner, alcohol for the Pullman Pioneers eased the monotony of rail travel across America, and so became integral to the overall experience of touring new places. The presence of alcoholic beverages at the Marshall/Firehole Hotel site shows that Yellowstone Park was more than a terminus of a trip across America; continuity existed between the actual travel event and the expectations for the eventual destination.

Alcoholic consumption by early park tourists is reflected in eight fragments of glass containers, identified by manufacturers' marks, and or manufacturing technique. The broad group of alcoholic beverages is divided between three wine or champagne bottles (all bases), and five beer or lager bottles (four bases, one nearly intact). Of the wine/champagne bottle-bases, two pieces are embossed with unidentified manufacturers' marks (Fig. 3.30, left and center), while the remaining is an unmarked base (see Fig. 3.30, right), and is identical to bottles found in the Fort Union collection (Wilson 1981:21 no. 55). Though none of these bases are connected to specific manufacturers, they exhibit 19th-century features, such as irregular thickness along glass walls and inner basal edges, placing them within the context of the Marshall/Firehole Hotel site and early park tourism.

The five beer/lager bottle fragments are identified by the presence of 19th-century manufacturers' marks. The first is a nearly complete beer/lager bottle (Fig. 3.31) manufactured in a two-piece mold with separate base plate by the Streator Bottle & Glass Company, Streator, Illinois (1881–1905). By the company's formation in 1881, Streator's reputation as a window and decorative glass-manufacturing town meant no serious local competition for a bottle factory. After two sluggish years of bottle production the company fortuitously hired Matthew W. Jack. Recruited

Fig. 3.30 Unidentified wine bottle bases. Left marked "H/F"; center marked "N/II"; right unmarked with high kick-up base (Courtesy of the PAST Foundation © 2001)

Fig. 3.31 Nearly intact beer bottle, base, and cork. Streator Bottle & Glass Company, base embossed "S B & C Co/H" (Courtesy of the PAST Foundation © 2001)

from the dry-goods business, Jack had proven himself a successful salesman, and continued his success in the bottle business by negotiating a deal with Adolphus Busch, pioneer of pasteurized beer and national marketing (Toulouse 1971:461–463; Wilson 1981:1–2). With a supply contract and financial backing from Busch, the company grew to employ over 300 workmen (sixty of which were glass blowers), working three eight-hour shifts in the spring and two eight-hour shifts in the remaining seasons. Between 1898 and 1900, the company bought the unsuccessful Streator Flint Glass Works, and began adapting their shops to semi-automatic bottle production (Toulouse 1971:461–463).

Within the next five years, Matthew Jack, Adolphus Busch, and Edward H. Everett (of the Ohio Bottling Company), merged their respective interests to form

the American Bottle Company with a capital stock worth $10,000,000 (Toulouse 1971:30–32). The merger allowed the glass works of the Streator Bottle and Glass Company to fall under the exclusive license to manufacture beer and soda bottles with the first fully automatic Owens machine held by the Ohio Bottling Company, and resulted in the adoption of the "ABCo" mark on their bottle bases (ibid.). Beer bottles marked with the Streator Bottle & Glass Company initials, "S B & G Co," were only produced between 1881 and 1905 (Toulouse 1971:461; Wilson 1981: 123 –124, no. 189–204 for variations of the company's initials), and so this particular bottle falls directly in the context of early park tourism.

The remaining beer-bottles exist only as basal fragments, and are identified by their bottlers' marks, and/or similarities to Rex L. Wilson's description of the Fort Union glass assemblage ranging from 1863 to 1891 (Wilson 1981). The second beer-bottle base (Fig. 3.32) was produced by the Findlay Bottle Company, Findlay, Ohio (1888–1893). Among beer and soda bottles, the company produced an array of food and medicine containers, but placed their initials, "F.B.Co," only on wares intended for beer, soda, or canning (Joe Terry 1 May 2002, personal communication with Kimberly E. Monk). Toulouse (1971:197) makes reference to an "F B & Co" mark found on the base of wax-sealer fruit jar, but he admits having no information for the mark's owner. During its five years of existence, the Findlay Bottle Company also produced glass battery housings for the St. Louis Battery Company, but eventually ceased all glass production in 1893 due to a shortage of natural gas in Northwest Ohio (Joe Terry 1 May 2002, personal communication with Kimberly E. Monk). Though unfortunate for the owners of the Findlay Bottle Company, the brief period of operation places this bottle in the last three years of the Marshall/Firehole Hotel.

A third beer-bottle base (Fig. 3.33) has two possible manufacturers, the Ihmsen Glass Company, Pittsburgh, Pennsylvania (1855–1896); or the Illinois Glass Company, Alton, Illinois (1873–1929). Both companies produced an assortment of bottles and products, with nearly identical initials for their mark (Toulouse 1971: 261–264, 264–268; Wilson 1981:117–188, no. 83–95). The Ihmsen Glass Company's mark "I G Co" appears on their bottles between 1870 and 1895, while the Illinois Glass Company's mark "I G Co" (note slightly smaller "o") appears on their bottles between 1880 and 1900 (Toulouse 1971:261, 264). Wilson (1981:118, no. 91) identifies the initials, "I G Co/L," on an unidentified beer, bar or bitters bottle as belonging to the Ihmsen Glass Company (this example also appears to be the larger "o," not on the base from the Marshall/Firehole hotel site). Toulouse (1971:263, 266) notes that Ihmsen company initials are "rare and found on some unmistakably Pittsburgh bottles," while the Illinois Glass Company continually increased production in the decades around the turn of the 20th century, in 1905 being the first to produce over one million bottles by hand. Whether manufactured in Pittsburgh or Alton, bottles bearing these initials can confidently be dated between 1870 and 1900, well within the context of the Marshall/Firehole Hotel.

A fourth beer-bottle base (Fig. 3.34) was produced by Chase Valley Glass Company, Milwaukee, Wisconsin (1880–1881). In the spring of 1880, Dr. Enoch Chase began construction of two small glass furnaces just outside Milwaukee's city

Fig. 3.32 Beer bottle base, "F. B. Co/4" Findlay Bottling Company (Courtesy of the PAST Foundation © 2001)

limits. Before completion of the second, larger furnace, Dr. Chase transferred its ownership to the Chase Valley Glass Company No. 2, in which he held controlling interest. The first smaller furnace consequently became known as the Chase Valley Glass Company No. 1, though distinction between the two companies soon ended in 1882, as Dr. Chase incorporated both furnaces into the Wisconsin Glass Company (Toulouse 1971:111–112). Chase's new company marked its large variety of glass containers with the initials, "WIS. G. Co./MILW," during four brief, successful years (Toulouse 1971:541–542; see Wilson 1981:124–125, nos. 208–225). Over-diversification led to the Wisconsin Glass Company's closure in

Fig. 3.33 Beer bottle base, "IG Co L". Ihmsen Glass Company, or Illinois Glass Company (Courtesy of the PAST Foundation © 2001)

1886. Two years later, Arthur P. Ayling purchased the company's assets for $20,000 (in 1885 the company's capital was $150,000), forming the Cream City Glass Company solely for the production of beer bottles (Toulouse 1971:119, 541). Marking its products with the initials, "C C G Co," the Cream City Glass Company rose in value to $237,000 in 1892 from the production of beer and newly added fruit jar line (Toulouse 1971:119). The depressed economy of 1894 then forced the reorganization of Ayling's company into the Northern Glass Works, which promptly failed by 1896, when the company's president, William Franzen, paid $10,000 to incorporate it into his own company, William Franzen & Son (1896–1929). Franzen previously was a second hand bottle dealer in the Milwaukee area, and succeeded in raising his company's worth to $300,000 by 1900 through improved beer-bottle quality (Toulouse 1971:537). Throughout the ceaseless reorganizations of the 1880s and 1890s, the furnaces constructed by Dr. Chase produced countless bottles for Milwaukee's brewers, whose bottled beer flooded western sites (Toulouse 1971:152; Wilson 1981). Since each company derived from Dr. Chase's original plant existed only for brief intervals, their marks provide finite date ranges. This particular mark found on the Marshall/Firehole Hotel site occurred only between 1880 and 1881 (more likely 1881, since the number "2" suggests Chase's second furnace), and so this piece represents an early shipment of alcoholic beverages onto the site.

Fig. 3.34 Beer bottle base, "C/2/MILW" Chase Valley Bottling Company (Courtesy of the PAST Foundation © 2001)

The fifth beer-bottle base (Fig. 3.35) does not possess letters or numbers indicating any specific bottle manufacturer. In the center of the base, however, is a small raised dot, with a circular ring, identical to Wilson' no. 276 in the Fort Union collection (1981:128). Based on this similarity, and the free-blown method of production, this artifact is considered within the context of the Marshall/Firehole Hotel site.

Besides alcoholic beverages, three other types of glass containers are identified within the context of the Marshall/Firehole Hotel and early park tourism. Glassware's manufactured for the bottling of soda water, flavored extracts, and sauces are represented in seven fragmentary artifacts collected from the site. Four examples of soda/mineral water bottles are identified by form and or maker's mark (see Wilson 1981:30–31, no. 79, 86–87). The extract and sauce bottles are identified only through embossed lettering describing their contents.

As a beverage with no refrigeration or pasteurization requirements, soda water quickly gained favor on Western-American settlements as an easily transportable product that could be safely substituted for drinking water, or combined with a variety of flavored extracts simply for enjoyment. With the introduction of soda water to early-19th-century America, a new style of bottle was developed to contain the pressures of artificial carbonation. Bottles designed to hold soda water, therefore, are distinguished by thick glass walls and collars, and rounded or flat bottoms.

Fig. 3.35 Unidentified beer or bitters bottle base (Courtesy of the PAST Foundation © 2001)

Thick collars provided extra support for the wired-on corks, while rounded-bottoms ensured the bottle would lie flat, thus keeping the cork moist (Wilson 1981:29–30).

Two soda water bottle fragments collected from the Marshall/Firehole Hotel are embossed with "BELFAST" (Fig. 3.36, top pair) referring to at least two bottlers, Ross's Royal Belfast Ginger Ale, Belfast, Ireland; or Cantrell & Cochrane, Belfast and Dublin (Fountain and Colcleaser 1968:69, 81). Corresponding examples of these bottlers were also identified in the Fort Union collection with date ranges of 1875–1890 and 1875–1885, respectively (Wilson 1981:30–31, no. 79, 86–87), which places the Marshall/Firehole Hotel site's examples in context with early park tourism. Though the third soda water bottle fragment (see Fig. 3.37, bottom right) does not show embossed lettering, the rounded-bottom, a characteristic of 19th-century soda water varieties (Jones and Sullivan 1989:72), places this artifact in the same context as the previous two. Similarly, the fourth soda water bottle contains no mark, but is identified through its crown finish designed for an early wire stopper (see Fig. 3.36, bottom left).

The final three glass artifacts placed within the context of the Marshall/Firehole Hotel site are two body fragments of extract bottles and the shoulder/neck/finish portion of a sauce bottle. Used for flavoring food or curing ailments, extracts proved a stable, easily transportable product from the inclusion of alcohol in their preparation. Similarly, the highly acidic content of sauces ensured their viability within western shipments. Individuals living in western locations were particularly mindful of stable food sources (Wilson 1981:81–82), and so the presence of these products

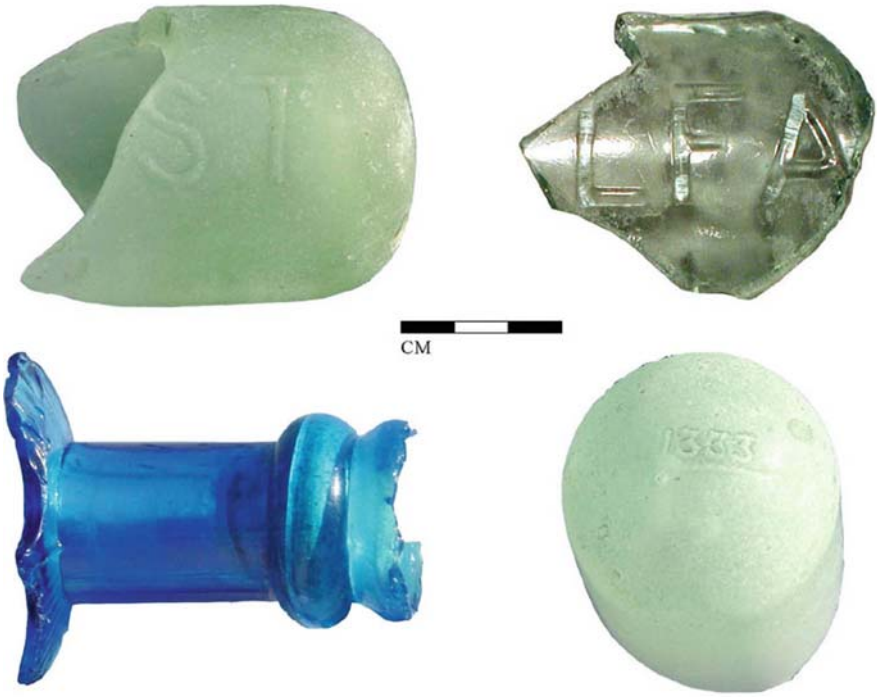

Fig. 3.36 Soda water bottles collected from 2000 and 2001 inventories. *Top left* "ST"; *top right* "LFA"; *bottom left* unidentified maker with crown *top* for wire stopper; *bottom right* unidentified maker "1333" (Courtesy of the PAST Foundation © 2001)

Fig. 3.37 Extract bottles. *Left* "PECIA/G EX"; *right* "EMO/OSTO/U.S" (Courtesy of the PAST Foundation © 2001)

on the Marshall/Firehole Hotel site indicates continuity between food consumption of early park visitors and those at other western settlements. This site raises the questions for future research of whether or not the home life of those first park visitors required less constraints on food stability, than did the average western home

life; and whether or not these individuals could accurately anticipate the availability, or safety, of certain food products to a degree in which healthy choices for consumption could be made. If early park tourists had less knowledge of reliably safe food products, the role of concessionaires in the park certainly was elevated above providing only luxury and enjoyment services, they must also have assumed responsibility for assimilating these new-comers to a western diet.

The fragments of glass extract bottles on the Marshall/Firehole Hotel site represent the use of extracts in food preparation during the 19th century. The first artifact (Fig. 3.37, left) carried the contents of Dr. Price's Special Flavoring Extracts intended for baking. In the Fort Union collection, Wilson identified a container with a similar variety of this brand, and provided an advertisement (Chicago Daily Tribune, 1882 in Wilson 1981:83) for the same brand found on the Marshall/Firehole Hotel site:

> DR. PRICE'S SPECIAL FLAVORING EXTRACTS
>
> Natural fruit flavors. Dr. Price's Special Flavoring Extracts. Prepared from the choicest fruits, without coloring, poisonous oils, acids, or artificial essences. Always uniform in strength, without any adulterations or impurities. Have gained their reputation from their perfect purity, superior strength and quality. Admitted by all who have used them as the most delicate, grateful and natural flavors for cakes, puddings, creams, etc. ever made. Manufactured by Steele & Price, makers of Lupulin Yeast Gems, Cream Baking Powder, etc., Chicago and St. Louis (The Chicago Daily Tribune 1882).

The second artifact likely carried the contents of Joseph Burnett's lemon extract (see Fig. 3.37, right). Burnet began his career in Boston, Massachusetts, as a chemist and bottler of a popular asthma remedy. In 1847, he entered the extracts market with the first commercial vanilla extract in the United States (Johnson 1961:61–62), but by the mid-18th century, Burnett also bottled at least three other products: a cocaine as a hair-loss treatment; a kalliston as a combination perfume, freckle remover, and toilet wash (Harper's Weekly 1861 in Wilson 1981:64–65); and a lemon extract likely as a food flavoring (Switzer 1974:78). In both the Fort Union and steamboat *Bertrand* glass assemblages, Joseph Burnett's products were placed in flat-sided medicine bottles embossed with "BURNETT" and "BOSTON" (Switzer 1974:78; Wilson 1981:79, 84, 86, 87 nos. 282, 285, 303, 310), indicating that this flat-sided glass fragment from the Marshall/Firehole Hotel site is likely also to have carried a Burnett product.

The third glass artifact is the remnants of a Curtice Brothers sauce bottle (Fig. 3.38). During the 1860s, Simeon G. Curtice began canning his surplus fruits and vegetables out of his small grocery store in Rochester, New York. By 1868, Simeon's success led to the abandonment of groceries and to the establishment of a new fulltime canning business in partnership with his brother Edgar (Zumwalt 1980:101–102). Throughout the next fifty years, the Curtice Brothers label packaged a wide assortment of food products in bottles bearing their full name, particularly on the necks of ketchup bottles and on the shoulders of sauce bottles (Toulouse 1971:150).

Fig. 3.38 Curtice Brothers sauce bottle, "RTICE BROTHERS" (Courtesy of the PAST Foundation © 2001)

In 1920, Edgar Curtice's life and controlling stock had passed, as the company was purchased by Douglas C. Townson. Stemming from the original Curtice brothers, the company is known today as Curtice-Burns, Inc., makers of private labels for large supermarket chains (Zumwalt 1980:101–102). The use of identical initials on Curtice Brothers and Curtice-Burns bottle bases is problematic for dating purposes, the full name "Curtice" written in script on the shoulder, and the broad sloping collar place this artifact within the context of the Marshall/Firehole Hotel site.

Two glass artifacts representing 20th-century park tourists were also collected from the Marshall/Firehole Hotel site. Though these pieces are not considered within the context of the tourist structures on this particular site, they are considered within the overall context of Yellowstone Park tourism. Park visitors of the late 19th century typically sought a combination of leisure and luxury directly from park concessionaires. In contrast, park visitors of the mid-20th century sought a combination of leisure and access to park facilities indirectly from concessionaires. With the development of park roads, visitors no longer required an attentive guide to direct their experience through Yellowstone, and so their relationship with park concessionaire did not provide the same catering atmosphere as those of previous years. During the third decade of the 20th century, park construction had not only given access to America's motorized tourists, but it had eliminated the need for a level of catering which occurred during the park's early years. Within this context, artifacts post-dating road construction represent items brought into the park directly by tourists, as opposed to ones brought for tourists.

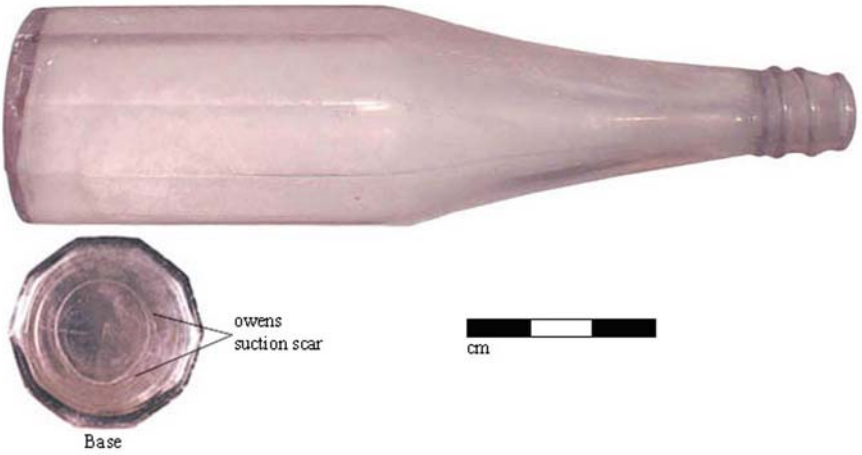

Fig. 3.39 Intact ketchup bottle. Fairmount Glass Works, base embossed "F". Note Owens suction scar (see Jones and Sullivan 1989:38) (Courtesy of the PAST Foundation © 2001)

The first of these 20th-century artifacts is an intact ketchup bottle (Fig. 3.39) manufactured in a fully automatic Owens' Machine by the Fairmount Glass Works, Indianapolis (1905–1945) (Toulouse 1971:200). Originally operating out of Fairmount, Indiana, the company underwent several name changes during its existence from 1898 to 1968. Always including the word "Fairmount" in each version of the company name, the letter "F" remained constant throughout accompanying variations of their trademark. Only between 1930 and 1945, however, was a solitary letter "F" embossed on the bases of their glasswares (Toulouse 1971:200–202). Fairmount Glass Works produced nearly every type of bottle in use during the first half of the 20th century; however, in 1929 they began selling bottles to Curtice-Burns (formerly Curtice Brothers), makers of canned fruits, sauces, and jellies. Whether this particular bottle carried the products of Curtice-Burns cannot be soundly proven, though its distinctive decagonal shape strongly suggests ketchup as its former contents.

The second 20th-century glass artifact (Fig. 3.40) is a bottle base from an unidentified container, but manufactured by Obear-Nester Glass Co., East St. Louis, Illinois (1894–ca. 1971). The company originally began as Allis & Obear Co. in 1891, but changed their name to the present form within three years (Toulouse 1971: 373–374). Found on one of unidentified bottle bases not discussed above is the manufacturer's mark "A & O." Since no mention of these initials is found in reference guides, there is no clear indication of Allis & Obear Co. manufacturing this piece. For the next two decades, the Obear-Nester Glass Company marked their wares with a variety of trademarks incorporating either or both the "O" and "N" initials (Toulouse 1971:373–374). In 1915, the adoption of semi-automatic bottle machines in the plant prompted a new company trademark of an "N" within a square (ibid). This mark continued until the late 20th century (Peterson 1968:43; ibid.), and so is a poor mark for dating purposes.

Fig. 3.40 Unidentified bottle base, "40/ N " Obear-Nester Glass Co. (Courtesy of the PAST Foundation © 2001)

The oldest dated glass artifact (Fig. 3.41) is a bottle base manufactured by John Kilner & Sons, Wakefield, York, England (1844–1847) (Toulouse 1971:279–281). In 1844, John Kilner and two of his sons started the Calderwood Glass Works in Wakefield, producing bottles and paperweights marked with either his full name, or his initials, above the word "Wakefield" or "W." By 1847, Kilner, his two sons from the Wakefield plant, and two more sons, purchased the Noah Turner Flint Glass Works at Thornhill Lees, England, keeping their former company name, but substituting the "W" for a "T." The company continued operating under the name John Kilner & Sons until 1857, when John passed away, and his sons reorganized as Kilner Bros. Glass Co., using the "K B G Co." as their new mark (ibid.). Though some uncertainty exists if the Wakefield plant continued production after the move to Thornhill Lees, Toulouse (1971:279) dates the "J K/W" mark only during the years 1844–1847, though it might conceivably have remained in use until 1857 with death of John Kilner and the trademark change.

Whether the "J K/W" marked bottle was saved and reused by someone associated with the Marshall Hotel will never be known. More likely, a passing trapper discarded the bottle, purposely or accidentally, long before the lands of Yellowstone became a national park. As early as 1807–1808, the first white-man documented the Yellowstone area when famed mountain man John Colter of the Lewis and Clark

Fig. 3.41 Bottle base, "J K/W/1510." John Kilner & Sons (Courtesy of the PAST Foundation © 2001)

Expedition traveled through the wilds of Yellowstone. With Colter, the intermittent commercial exploitation and exploration of the region began. It would last through the fur-trading era of the northern Rockies (Haines 1977a:35), and it is entirely possible that this early bottle was left behind by one of those wily trappers following Colter's footsteps.

Much changed in "Wonderland" between Colter's awed jaunt through a strange new wilderness and the modern Park we see today. As the first simple hotels came and went, the finery of the Park's Grand Hotels evolved. With the increased number of tourists brought by the railroad, the amenities and facilities in the park increased. With better facilities and improved transportation through the park, a decreased reliance for full time tour guides through the wilds of Yellowstone soon followed. Finally, the coming of the automobile would ultimately democratize the park and the variety of tourists like never before (Schwantes 2001:136).

Automobiles were admitted into the park in 1915, and with their arrival "Wonderland" was changed forever (ibid.). Automobiles meant the need for new and

Fig. 3.42 Lead toy car (Courtesy of the PAST Foundation © 2001)

well-maintained roads and camping facilities – with better access to all that Yellowstone had to offer. Automobiles gave way to the modern tourists – like those who left behind a small lead toy (Fig. 3.42), an assortment of fishing paraphernalia, and loose pocket change. All constitute the variety of modern tourist's impact to the Marshall/Firehole Hotel site – and all represent the continuing popularity of the location within the park. Clearly, George Marshall was on to something when he chose flat ground and sublime vistas for the location of the park's first hostelry. The vistas are still enchanting to the modern tourists who, today, wade and fish in the river and picnic on the hillside rather than stay for the night.

Students in the Field

A primary objective of the Marshall/Firehole Hotel Underwater Archeology Project was to incorporate student volunteers as the field crew. To meet that objective, the project partnered with teachers and students from the Science Focus Program of the Lincoln [Nebraska] Public Schools that is based at the Folsom Children's Zoo and Botanical Gardens. Due to its classroom location, the school is commonly referred to as the "Zoo School." The project crew was composed of ten high school students (juniors and seniors), two high school teachers, a graduate student from East Carolina University, and one undergraduate student from the University of Nebraska-Lincoln.

To prepare the Zoo School teachers and students for their week in the field, Hunt spent several afternoons at the school providing basic instruction in archeological goals, method, and artifact identification prior to the fieldwork. Once in the field the students participated in several "site preps" including: (a) a discussion and tour of the Marshall Hotel by Hunt (Fig. 3.43); (b) an introduction to artifact types that would be encountered during the site-inventory by Harris (Fig. 3.44); (c) site methods and procedures in an underwater environment by Corbin (Fig. 3.45); (d) a discussion and tour of the prehistoric history and sites at Yellowstone by Park Archeologist Ann Johnson; and (e) an instruction in archeological field records and journals by Corbin and Zoo School teacher LeRoy-Toren. All of the participants of the project were required to keep detailed journals and field notes (Fig. 3.46); samples of which can be found on the PAST website at http://www.pastfoundation.org/.

Fig. 3.43 A site tour by William J. Hunt, Jr. oriented project volunteers to its history, features, and artifacts (Courtesy of the PAST Foundation © 2001)

Once the site prep and tours were complete the students were ready to embark in their first archeological project.

Conclusions

The story of the Marshall/Firehole Hotel in Yellowstone National Park is a tale of rugged spirit and remarkable enterprise, hidden from Yellowstone's many early tourists. Through our brief moment of work on this site, the project team had the rare opportunity to see a side of Yellowstone's story that most cannot imagine. Modern park visitors see paved roads and parking lots, modern restrooms, hotels, and restaurants; they see a picturesque park with well-orchestrated infrastructure, rarely encountering the pure, harsh beauty of Yellowstone. For ten high school students and their teachers, the Marshall Hotel was once again alive and thriving as a refugium of civility in a wild landscape.

With a magnificent backdrop of geysers, hot springs, mudpots, and wildlife, this excavation, as an outdoor classroom, became more than a simple inventory of a sterile resource. Not only did our student team have the opportunity to see the hotel in its modern, camouflaged context, but also they actively participated in our efforts to reconstruct the hotel site's natural and historical landscape. Each person's

Fig. 3.44 In camp, students and teachers were shown typical artifacts from the river (Courtesy of the PAST Foundation © 2001)

individual process of conceptualizing the past, whether student or archeologist, became inseparable from the group experience; here the learning was mutual. Classroom components, focusing on environmental, cultural, and wildlife themes, helped the students see the Marshall Hotel site not only as it remains today, but also as it was in the 1880s. The student experience had a profound impact on how we, the archeologists, viewed and interpreted the site. We remain ever grateful for their vision and enthusiasm.

Landscape and Land Use Plan

The cultural landscape and land use of a location by a cultural group reflects, in many ways, the character of its economy and its relationship with other economic entities. "We did not create Yellowstone National Park one day early in 1872. Instead, on that day we embarked upon an ongoing process – a work in progress– based upon our always growing knowledge of the park and upon our changing attitudes about our relationship with nature" (Schullery 2001:239–240). It is clear that the Marshall/Firehole Hotel site represents an early frontier settlement, but what kind of settlement?

Fig. 3.45 A riverside lecture described project investigation goals, procedures, and safety rules (Courtesy of the PAST Foundation © 2001)

Kenneth Lewis (1984:264) has noted that frontier colonization as a part of an expanding world economy follows two general courses. The first, which he calls the "insular frontier," is a permanent occupation of a region by agriculturalists. In this type of development, organization becomes increasingly complex. Economic emphases are placed on production of commercial exports and development of an internal economy (Lewis 1984:19).

The second development is the "cosmopolitan frontier." These frontiers are created in response to a "specialized, extractive economic activities in peripheral areas of the world economy" (Lewis 1984:264). Their limited focus often results in these being short-term, impermanent frontiers. Further, their close economic ties to the "homeland" results in a lack of a sense of separateness or segregation from the homeland. Insular frontiers, on the other hand, develop a greater sense of autonomy and self-identity separate from the homeland. The result is that changing structures within cosmopolitan frontiers don't usually arise from the frontier environment (social and economic) itself but is generally an adaptation to the greater economic system to which it is tied. "As a consequence, cosmopolitan frontiers exhibit a greater degree of cultural uniformity despite their varied environments" (Lewis 1984:264). Lewis goes on to describe six basic types of colonization within cosmopolitan frontiers: trading frontiers, ranching frontiers, exploitative plantation frontiers, industrial frontiers, military frontiers, and transportation frontiers.

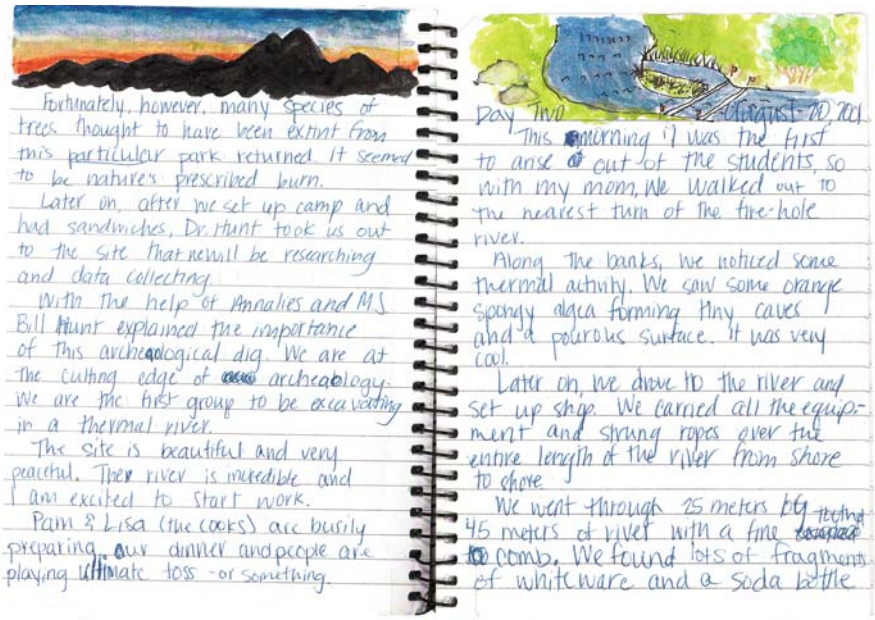

Fig. 3.46 Student journal entry (Courtesy of the PAST Foundation © 2001)

We would offer that tourism is a seventh type of cosmopolitan frontier, especially where it is promoted and developed in remote regions such as at Yellowstone. Its evolution at Yellowstone is illustrated by the rapidly changing character of three hotels established in the Lower Geyser Basin between 1880 and 1891: Marshall, Firehole, and Fountain.

It seems clear that the earliest of these facilities, the so-called "Marshall Hotel" was established in the fall of 1880, not in response to tourism but more as an element of a transportation frontier. As Lewis describes it, these frontiers consist solely of transportation routes and the settlements necessary to maintain them. The Marshall "hotel" was really more like a typical period "road ranch," a facility established to feed and shelter passengers, employees, and draft animals of a stage line. In this case, the Marshall Hotel served the needs of the "Virginia City and Hot Springs Line" mail stage. Its structures included a small log house, barn, and unspecified "outbuildings" (Haines 1977a:254).

Within the year, Marshall's mail carrier contract was canceled. The hotel began taking on the guise of the cosmopolitan frontier enterprise focusing on the tourist trade. George Marshall decided to expand his enterprise. Marshall apparently built his first hotel in 1880 with a partner, John B. Goff. Whittlesey (1980:46) describes the hotel building as "a log house of two stories [and an extension] with six rooms. Four rooms were used for lounge, dining room, kitchen, and quarters for the Marshall family, while two rooms were for guests."

A map of George Marshall's January 29, 1884, claim (actually surveyed on July 30, 1885) illustrates the plan for the original site of Marshall's 1880–1884 hotel on the west side of the river. This map suggests the primary structure, the hotel, had been torn down by this time with four supposedly abandoned outbuildings still in place. Together, they create a linear arrangement of structures nestled up against the base of a steep southwest–northeast oriented hill. Domestic structures, a hotel and outbuilding, are at the center of the arrangement, the porch of the T-shaped hotel facing southeast – away from the hill toward an open valley vista and the river. On each end and separated by some distance are outbuildings (stable, corral) for draft animals, and two log houses of unidentified function. The latter are about the same size as the outbuilding behind the hotel and may be outbuildings. One may be the original log cabin constructed by the Marshall family in 1879–1880 and/or served as housing for their Chinese employee (Whittlesey 1980:47).

The primary approach to the site was from the west via the present "Old Fountain Pack Trail," down a steep ridge to the hotel at the base of the ridge. This approach was described by one of the visitors, Mrs. Foster (first name unknown), in 1882: "Down-down-down we go, brakes [*illegible*] on, and pull up with a thud at 'Marshall's Hotel" (Whittlesey 1980:46).

A footbridge and ford across the Firehole River provided access to a combination washhouse and bathhouse near Hygeia hot spring. It was constructed of logs and had two rooms; the front room opening into the bath, the backdoor nearer the spring opening into the laundry. A wooden trough carried water from the spring to the laundry (Whittlesey 1980:46–47). This may be the same as a linear feature described by archeologists in 1993 as a buried wooden hot water pipe (Hartley et al. 1993:26). If so, the length and orientation of this structure suggests the bath may have been where the Fountain Freight Road is now.

One of the signal characteristics of any economic enterprise within a cosmopolitan frontier is maintenance of close ties with the core state economy. In other words, success of a business is heavily dependent upon outside assistance and there is no attempt made to establish a subsistence base within the colony (Lewis 1984:268). Further, the business is directed from a distance by absentee owner/manager capitalists. There is a rapid turn-over of "settlers" who view residence on the frontier as temporary. These are the characteristics of tourism.

Again, the original "hotels" in Yellowstone (McCartney's at Mammoth and Marshall's in the Lower Geyser Basin) certainly did not fit this definition entirely. Ownership of the hotel was a family affair, its management in the hands of individuals who lived at the facility. The services were minimal because there was no outside capitalization. The lack of a subsistence economy was there, as virtually all food and goods had to be obtained from the "homeland" in the East. This may be the characteristics of all incipient cosmopolitan frontiers, however – individuals establishing claims which, due to a lack of developmental capital, are quickly acquired and operated by a larger business or corporation.

The transition to a full-fledged tourist operation with absentee landowner came quickly for the Marshall Hotel. Marshall needed additional capital to build a new complex on the east side of the Firehole River solely dedicated to serving tourists.

To this end, Marshall formed his partnership with George G. Henderson early in 1884 (Haines 1977b:401, n35) and gained a ten-year lease from the government (Whittlesey 1980:44). A new hotel was raised about 330 ft (about 100 m) east of the Firehole River and 260 ft (about 80 m) northwest of Hygeia hot spring. This was to be the center of a new complex built on an entirely different plan from the first set of hotel structures.

In contrast to the steeply sloped topography of the first hotel site, the site selected for this new complex was an almost flat open area occupying a 920 ft (280 m) wide bulge in a "peninsula" of land between the Firehole River and Nez Perce Creek. To the north, the ground rose gradually to a rocky ridge and hill (the modern location of the Nez Perce Picnic Area). The south was marked by a constriction in the "peninsula" where Nez Perce Creek approached to within 436 ft (133 m) of the Firehole before it turned back to the northeast. The ground here is sandy and would have been well-drained even during the wettest conditions. The impact of human and animal traffic in this area would have probably had significant impacts on the fragile soil surface and it is likely the ground was quickly denuded in and immediately around the hotel complex. Long-term use of the surrounding area as pasturage by the hotel's twenty-five horses and eleven cows as well as by the horses of hotel guests and free campers likely affected the variety and relative quantities of the various grasses and forbes in this portion of the park. Certainly, the large amount of wood required as building materials and for use in heating and cooking would have initiated the denudation of surrounding forests.

Marshall sold out to George G. Henderson in May of 1885 (Haines 1977b:401, n35; Whittlesey 1980:49). In turn, Henderson, entered partnership with Henry Klamer, son-in-law of Cottage Hotel Association president George L. Henderson (Haines 1977b:401, n35) and the hotel was renamed the Firehole Hotel.

The 1885 claim map mentioned above was drawn up primarily to document the plan for the facility replacing Marshall's first hotel. This complex of structures, assembled on the west side of the river, was primarily confined to a four-acre square parcel although a few minor structures were located beyond its boundaries. Now, the primary approach has shifted to the north with travelers arriving along a road from Mammoth Hot Springs, fording the Nez Perce Creek, and then driving up a road looping to the hotel. A photograph (see Fig. 3.2) of the site from this approach suggests that the hotel complex was visible from at least a quarter mile and probably more since the area had fewer trees than today. In 1885, Park Avenue (Fountain Freight Road) was constructed from Marshall House to the Midway Geyser Basin (Haines 1977b:215) making the entrance to the hotel an element of the tourist route to the wonders in the Midway and Upper Geyser Basins.

Unlike the straight line arrangement of the first complex, this new structural complex was established as a somewhat open square with a visual focus on the two-story hotel. This was at the front of the complex and situated just east of the parcel's center at the edge of the entrance road loop. It faced east and was built in the shape of a backwards "**1**." Directly behind (west) of the hotel, at the approximate center of the parcel, was the provision cellar. This structure was screened from view during the tourists' approach. Archeologists also identified a small rock-lined well about

90 ft (28 m) southwest of the cellar which could have been used to supply water for human consumption. Perhaps the water from this well was of better quality than the highly mineralized water of the Firehole River.

A line of structures on the south margin of the parcel suggest a new frontier town. This line included "log dwellings" (for employees or for guests) and frame and log structures providing tourist services and entertainment (store, saloon, blacksmith shop). At the back (west side), at each corner of the parcel, are facilities for boarding animals and storing tack. It is assumed their location at the back of the parcel allowed animals to drink from the Firehole River. The map and the 1884 drawing (see Fig. 3.14) by Thomas H. Thomas illustrate the bathhouse near Nez Perce Creek. The bathhouse clearly has some kind of trench (or perhaps a wooden trough) running from the hot spring which is just out of view. The map demonstrates that the bathhouse is well outside the acreage set aside by the government for the hotel complex. A small structure illustrated northeast of the hotel is identified on the map as a dwelling and may be another guest cabin. This sits just south of the northeast corner of the parcel in opposition to the bathhouse.

As noted for the bathhouse, the distribution of all structures shows, however, that the hotel management did not confine itself solely to the parcel allotted to them. At least five structures on the map lie outside that boundary. Aside from the bathhouse, these include an unidentified structure about 150 ft (46 m) south of the parcel, a log house just beyond the south boundary near the hot spring. Two very small squares immediately outside the north boundary may be outhouses. The practice at the time was to have one facility for men and another for women. Archeological investigations found no evidence for any of these exterior structures but did identify a rubble concentration and geyserite tub believed to be associated with one of the hotel's bathhouses.

In 1886, the Yellowstone Park Association bought the Firehole Hotel. The YPA was always controlled by the Northern Pacific Railroad (Haines 1976c:23, 1996:163; Whittlesey 1980:49). This completed the process of developing the site and its evolution into a full-fledged cosmopolitan frontier economic entity. Site development continued as demonstrated by Captain Moses Harris' 1886 report that hotel accommodations had been increased by adding "two cheap wooden structures, two-stories high" which accessed the upper stories via staircases on the outside of the buildings (Haines 1977b:116; Whittlesey 1980:49). Archeological work identified the probable location of two structures not shown on the 1885 map which may correspond with these structures. The locations may be marked by a large building depression and concentrations of brick due north of the hotel just outside the parcel boundary. If so, their addition to the site balanced the site plan by mirroring the arrangement and function of structures already in place at the south margin, i.e., providing services and housing at the front (east) side of the parcel and facilities for their horses and gear at the rear of the parcel.

One final alteration to the cultural landscape here was produced in 1889. E. C. Culver and his wife Mattie were hired as the hotel's caretakers for the winter of 1888–1889. Mattie, who was tubercular, died on March 2, 1889. After the ground thawed, Mattie was buried by her husband and soldiers from the soldiers station just

north of the main road. The site selected is a rocky ridge north of the parcel and remains the only known burial at the site.

In 1890, facilities turned over to the US Army for summer encampment (Haines 1977b:116). Over the years, a number of the lesser structures were razed and burned by the military. Apparently, at least a couple of the hotel's structures were maintained for use by the army's encampment until at least 1909 (Whittlesey 1980:51). As a result, the site was functionally transformed into another type of cosmopolitan frontier, the military frontier. According to Lewis (1984:267), military frontiers are established to pacify regions and thereby protect other frontier activities. Camps such as this one were established to oversee the conduct of frontier activities and provide governmental control of peripheral areas.

The Marshall/Firehole Hotel site now became a component of a broad seasonal encampment spread over at least 0.772 mile^2 (2 km^2) of the Lower Geyser Basin's north end. This encampment incorporated at least three other entities: (1) the Fountain Soldiers Station occupied the year round and located about 0.3 mile. (0.5 km) northeast of the hotel; (2) the Fountain Military Camp which occupied the area south of Nez Perce Creek 0.6 mile (ca. 1 km) southeast of the hotel site; and (3) the army's firing range about 0.36 mile (0.6 km) southwest of the hotel site. Although the locations of all these sites are known, only the soldiers station has been recorded as a site to date. It is not known which of the hotel buildings were utilized by the army or how it used them although it seems likely they housed the unit command during the summer training camp.

At least during the operation of the site as the Marshall and then the Firehole Hotel, garbage disposal was a problem especially after the hotel facilities were moved to an open flat area between the rivers. With the first hotel, garbage could have been deposited in one of the nearby draws of the escarpment. With the site change, the easiest available location to put garbage was the Firehole River. This may have continued into the military era as well. This cultural alteration of the thermal river resulted in the addition of a broad array of mineral resources, especially iron, which some Yellowstone thermal water microbes seek as an energy source. Trash deposition may have enhanced microbe growth in the river at the hotel site resulting in establishment of microbial mats and ultimately enhanced stream-bed armoring at this location.

In sum, the Marshall Hotel complex evolved from a primitive set of structures laid out in a simple line. Structures were aligned with and along the base of a high, steep hill immediately behind them. The guest house was at the center of the alignment with support structures and facilities set apart some distance from that on each end. The access road approached from behind and passed though the structural complex. Although this economic enterprise doesn't really fit the characterization of a cosmopolitan it certainly fits the tourism context described in this volume.

The facility that replaced it in 1884 was much more town-like in character. This newer complex was accessed from the north. The complex was arranged in an open square with its water and food supplies protected at the center of the "courtyard." The guest facilities were on the side facing the access road, the hotel in the center and secondary guest lodgings in the square's northeast and southeast corners.

Facilities providing tourist support and entertainment were in the middle of the square: store, saloon, and blacksmith were placed in the south sides; well and provisions cellar in the center of the square; and structures estimated to be outhouses on the north side. At the back of the square were facilities for the care of horses and collateral equipment. These were located on northwest and southwest sides of the square. Peripheral structures were the bathhouse, which had to be placed somewhere near the hot spring, and two structures south of the complex, which may have housed Chinese and European American employees of the hotel. A long grave occupies the only high ground in the vicinity of the hotel north of the site.

This second complex rapidly assumed all the characteristics of a cosmopolitan frontier enterprise. As previously mentioned, it was acquired by the YPA, a company funded with capital from and controlled by the Northern Pacific Railroad. The managers in the business were ultimately the railroad capitalists. Its marketable commodity for the settled region in the East was tourism. No attempt was made to establish a subsistence base in the park; the business enterprise was itself a specialized focus in its short-term character. There was a rapid turnover of employees and low-level managers and for most a temporary occupation at best. All these are common characteristics of the tourism industry.

With the construction of the Fountain Hotel and the abandonment of the Firehole Hotel, the YPA (and descendants) business moved fully into the economic realm of the cosmopolitan frontier. The Lower Geyser Basin was now able to offer tourists all the amenities that could be expected in large urban areas along with the addition of the specialized entertainment only Yellowstone's geyser basins could provide. Yellowstone National Park continues to represent such a frontier to this date.

Abandonment of the Firehole Hotel resulted in the complex's acquisition by the park's US Army managers. The facility was largely torn down, the few remaining structures incorporated into the army's Lower Geyser Basin summer encampment. With this transfer and change of function, the site became an element of a diffused military base composed of scattered troop camps, a firing range, and a soldiers station with the former hotel structures probably used to house unit command. The site now became an element of the military frontier.

The apparent removal of the remaining hotel structures circa 1910 returned the site to its non-cultural status although the three decades of human activity at the location permanently changed many of its natural characteristics. Soils were altered, floral was probably changed (although this has yet to be demonstrated), and the river was now full of trash.

Retrospective

By and large, the Marshall/Firehole Hotel Project was a labor of love for those involved. The site was not, at first glance, being threatened in the traditional manners such as road construction or a new picnic area. By many management standards, there was little need to investigate the site. Certainly acquiring the resources to do

so would be impossible in park systems where funds are typically forth coming only when absolutely necessary. From this viewpoint, any work on the Marshall Hotel site would be purely research driven. So why pursue the tale of Yellowstone's first hotel and how do we justify both the funds expended and the time spent? The answer is three-fold.

First, the underwater component of this site represents a somewhat unusual issue within US landlocked parks. Unlike parks along seashores or large lake fronts where shipwrecks and submerged cultural resources dominate both the public view and the park's management plan, submerged resources in other areas are often secondary to bigger, more imminent problems. When we typically consider looting and vandalism related to underwater sites, it involves great depths, scuba tanks, and the full removal of both large and small artifacts. The section of the Firehole River adjacent to the old Marshall Hotel is not even deep enough for diving. In this case, the vandalism and removal of material culture was the result of fishermen and casual waders. For a number of years, park rangers were well aware of the looting, evidenced by piles of artifacts along the riverbank – yet, lack of resources and manpower meant little could be done to prevent it. Even after 1993, when the underwater component of the site was first reported, and the 2000 sampling by Corbin, the loss of material culture was staggering! Clearly the site needed documentation soon or all available data would have been lost.

Second, and most significantly, an investigation of the Marshall Hotel site provides an important opportunity to examine early tourism in Yellowstone National Park. The potential for a better understanding of park tourism from this site is virtually limitless. Few archeologists would argue that the individual intrinsic value of the material culture of the site is slight and certainly not worth curation. The value of the material culture assemblage is, however, without comparison when placed properly within the broader issue of tourism in the park. The Marshall/Firehole Hotel site holds unparalleled potential for a firmer understanding and interpretation of tourist's needs, wants, and demands in the late 19th century.

Finally, the site made for a wonderful opportunity to get both young people and the public involved in an underwater archeology project in Yellowstone National Park. Actual, hands-on involvement by the youth in most underwater archeology projects is difficult for a variety of reasons. Given the shallow nature of the underwater component of the Marshall Hotel site, ease in accessibility and staging due to proximity of the adjacent picnic grounds, and the willingness of the Lincoln (Nebraska) Public School System to conduct an outdoor classroom experiment, involvement with kids was possible. The benefits of the "experiment" cannot be understated. The project gained a field crew with a unique and fresh point of view. It is remarkable how often a young mind will raise issues and questions that those with more years and experience overlook, take for granted, or discount all together. The students' questions and queries soon became a driving component of each day's work. All involved would agree the student component of this project was one of the most rewarding to be part of and to watch. As Zoo School science teacher, Sara LeRoy-Toren, noted in her field journal, "[the] students distinguished themselves again today. The team has become a solid unit with two groups, each working from

the opposing bank to the center. Students walk four abreast with [a] fifth recording the artifacts and their location on the 5 × 5 m grid (16.4 × 16.4 ft). The speed of the group is inversely proportional with the number of artifacts located." We cannot understate how mundane this project would have been without our student crew.

Site Significance, Impairment, and Recommended Actions

The Marshall/Firehole Hotel site (48YE773) is *a highly significant cultural resource*. It certainly possesses integrity of location and setting. The paved road and picnic area are peripheral to the greater portion of the site but the road follows the route of the 1880s dirt wagon road over much of its course. The barrow pit has the greatest visual impact but, from the core of the site, a screen of trees prevents its intrusion on the observer standing in the middle of the hotel complex. Overall, the cultural landscape retains much of the character it did 120 years ago. These characteristics and the site's unique role in the history of Yellowstone National Park and the National Park Service as a whole, support the claim that the site is *eligible for nomination to the National Register of Historic Places* under Criterion A; that is, the Marshall/Firehole Hotel site is associated with events that have made a significant contribution to the broad patterns of American history.

Archeological data collected during site survey in 1993 and testing in 1993 and 1994 indicate that, despite claims to the contrary, the archeological component retains its integrity as well. Despite evidence for looting, especially in the site's underwater component, the site retains many elements on and beneath the ground surface. It retains data relating to the hotel complex's plan, construction, occupants, and evolution through the ten years it was in operation. This supports our determination that the Marshall/Firehole Hotel site is also eligible for nomination to the National Register of Historic Places under Criterion D; that is, it has yielded and is likely to yield information important to history.

The Marshall/Firehole Hotel site is much more than an isolated National Register site. Because the site reflects a core feature in the historical development of Yellowstone National Park and the National Park Service as a whole, it is intrinsically linked to all tourist facilities thereafter. As a progenitor of modern conceptions and expectations of what the National Park Service has to offer, the site possesses unique characteristics that make a superlative context for its otherwise unthreatened cultural resources.

The site *addresses a legislated purpose of Yellowstone National Park and the National Park Service* as expressed in the Organic Act, which simultaneously created the park and the agency. It represents a complex created to assist the public as they visited their new "public park or pleasuring-ground for the benefit and enjoyment of the people" (Haines 1977a, 1977b:471). Further, it was created to address a clause in the Organic Act whereby "The Secretary may in his discretion, grant leases for building purposes… at such places in said park [Yellowstone] as shall require

the erection of buildings for the accommodation of visitors" (ibid.). Although there are at least two older "hotels," one (at Mammoth) consisted of little more than a single log structure. The other (Marshall Hotel) was an assemblage of buildings built as a family home that was later used for housing guests as well. The site is *an exceptional representative of park planned development*, something that cannot be said of the other two locations. It was not only planned but it was the *first* such entity. Many have followed in Yellowstone itself (major developments at Mammoth, Canyon, Lake, and the Upper Geyser Basin; secondary planned developments at Roosevelt, Tower, Norris and Madison) with every major park in the system following and building upon the precedent set at the Marshall/Firehole Hotel complex.

The ongoing impacts constitute an impairment of the Marshall/Firehole Hotel site. As described by NPS Management Policies, "an impairment that is prohibited by the Organic Act and the General Authorities Act is an impact that, in the professional judgment of the responsible NPS manager, would harm the integrity of park resources or values" (National Park Service 2001:12). Impairment may occur from activities on the part of visitors, NPS, concessioners, contractors, and anyone else visiting, working, or operating in the park (ibid.:13).

NPS Management Policies note that "when an NPS decision-maker becomes aware that an ongoing activity might have led or might be leading to an impairment of park resources or values, he or she must investigate and determine if there is, or will be an impairment. If it [is] determined that there is, or will be, such an impairment, the Director must take appropriate action... to eliminate the impairment" (ibid.). Yellowstone National Park is in a unique position to take actions to halt the destructive activities at the site before an impairment investigation is required.

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