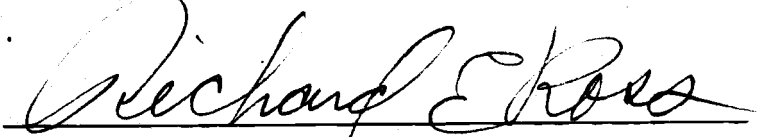


AN ABSTRACT OF THE THESIS OF

Dennis G. Griffin for the degree of Master of Arts in
Interdisciplinary Studies in the co-departments of
Anthropology, Anthropology and History presented on
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Title: Prehistoric Utilization of Thermal Springs in the
Pacific Northwest

Abstract approved:

A handwritten signature in dark ink, reading "Richard E. Ross", is written over a horizontal line.

Richard E. Ross

Natural thermal springs occur throughout the Pacific Northwest. The use and importance of this natural environmental feature to Native Americans prior to and during the period of initial white contact is examined. Ethnographic, archaeological and oral historical information is described in an attempt to reconstruct the role of these naturally-heated springs. This information is examined in relation to the location and temperature of springs in an effort to discover what influence hot springs had on the settlement and subsistence patterns of the early inhabitants of the three cultural regions that constitute the Pacific Northwest (Northwest Coast, Plateau and Northern Great Basin). An analysis of this data is

used to make an assessment of the value of thermal spring sites to the archaeological inventory.

An analysis of the current interpretation of the term "cultural resource" is examined in its relationship to sites having no empirically obvious and associated cultural remains. An argument is presented for a reliance on off site data including ethnographic and oral historical accounts. The current status of thermal springs in the Northwest Region is reviewed in reference to modern Native American concerns over the development of this natural resource.

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PREHISTORIC UTILIZATION OF THERMAL SPRINGS
IN THE PACIFIC NORTHWEST

by

Dennis G. Griffin

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the requirements for the
degree of

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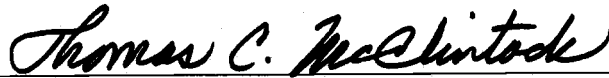
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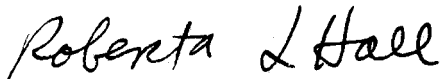
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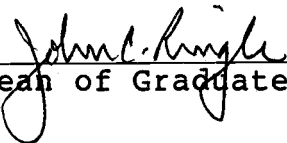
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PREHISTORIC UTILIZATION OF THERMAL SPRINGS IN THE PACIFIC NORTHWEST

I. INTRODUCTION

People throughout the world have long thought that thermal springs have beneficial value. Use of such springs has been documented for the Maori of New Zealand, the !Kung Bushmen of Africa, herdsman of Tibet, and the Japanese. A comprehensive account has never been attempted on how these springs were used by Native Americans and what importance, if any, was placed on them. In this thesis I compile ethnographical and archaeological data in order to evaluate the role of thermal springs in human adaptational strategies and ritualistic practices. Evaluation and analysis of this data add to our understanding of some of the environmental factors that influenced the lifeways of the human inhabitants of the Pacific Northwest, and provide insight to the research value of archaeological sites associated with thermal springs.

Natural thermal springs occur in large numbers throughout the Pacific Northwest (Figure 1). The abundance of archaeological material found near them and the frequent mention of Indians "using" the springs indicate the importance of such springs in Native American culture.

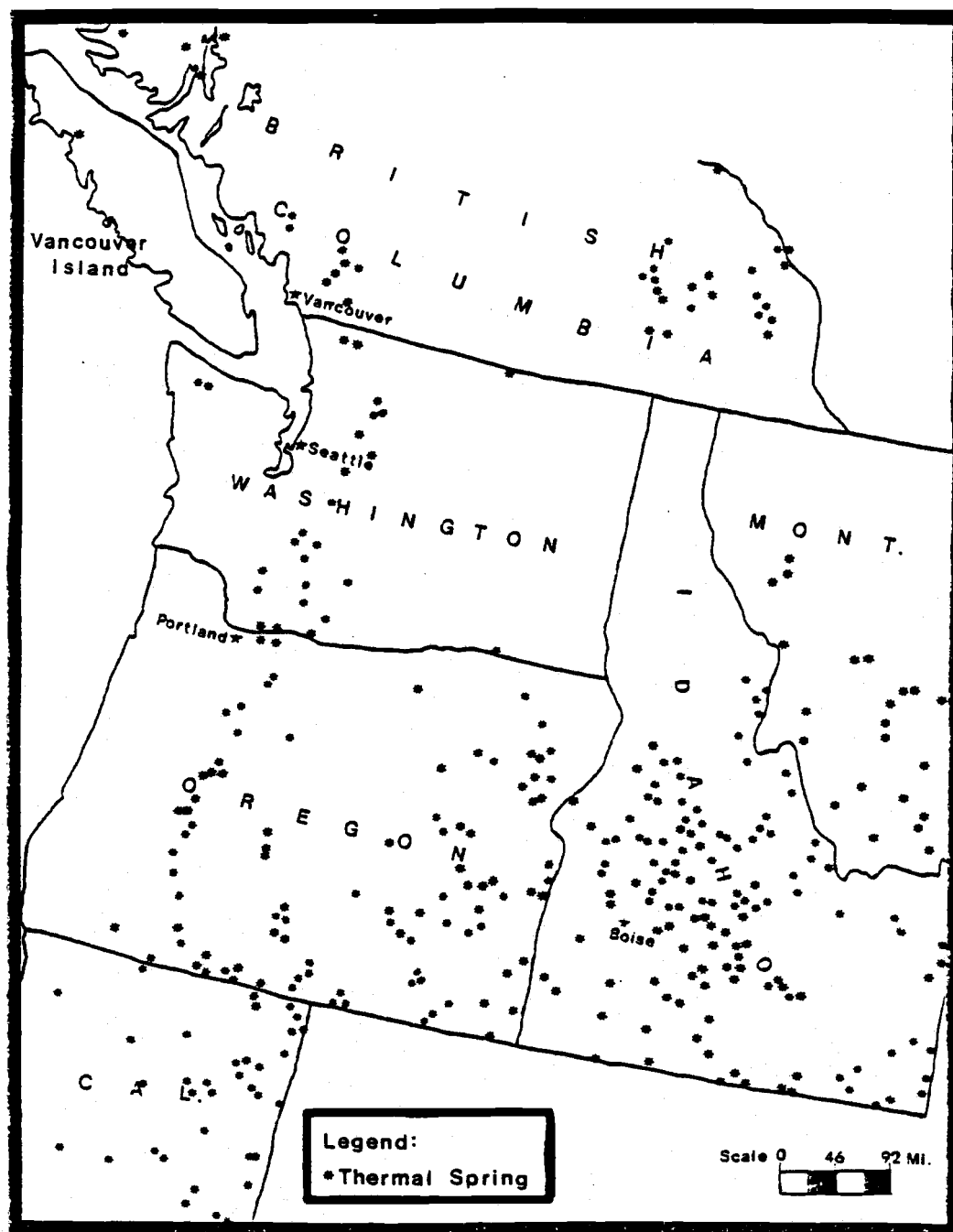


FIGURE 1

Distribution of Thermal Springs in the Pacific Northwest

An evaluation of the role and influence of thermal springs on native cultures, particularly in regard to settlement and subsistence patterns, is undertaken in this thesis.

The energy crisis in conjunction with the high cost of fossil fuels in North America today have resulted in the serious consideration of alternative energy sources. In this regard the potential importance of geothermal power has been recognized and the development of such power sources is rapidly expanding. Development of geothermal power sources, however, usually threatens the integrity of the natural thermal spring, the surrounding landscape and any associated cultural materials. Native American groups throughout the West have, therefore, begun to voice concerns over the possible destruction of thermal springs as a result of development. A full evaluation of thermal springs as a resource, including consideration not only of their geothermal power potential but also of their archaeological value and their value to extant Native American people, is mandatory prior to the complete destruction of these resources. In this thesis I focus on the latter two values of thermal springs.

Geographical coverage in this thesis is restricted to the Pacific Northwest, defined here as including British Columbia, Washington, Oregon, Idaho, and northern California. There are three cultural regions in the

Pacific Northwest (Kroeber 1939); the Columbia-Fraser Plateau, northern Great Basin, and the Northwest Coast (Figure 2). These cultural regions are geographical units that display internally homogeneous climate, topography, and vegetation. Further, each region is a continuous geographical unit within which the human inhabitants share a larger number of cultural traits than are shared with people in adjacent but different cultural regions (Ross and Brauner 1983).

An extensive and intensive search of ethnographical and archaeological literature pertaining to the Pacific Northwest was made. Numerous thermal springs were also visited by the author. Data gathered from the literature and field work demonstrate the integration of thermal springs into most aspects of Native American culture. The hypothesis that thermal springs were (and are) important to Native Americans in a variety of ways, especially for providing medicinal (physical) cures, spiritual consolation, and a reliable resource location, is confirmed by the data discussed here. Moreover, the ethnographic data suggest that thermal springs were used in a number of other ways, and the archaeological data indicate that thermal springs were utilized for the past 11,000 years throughout the Pacific Northwest and in many cases served as the loci of winter villages.

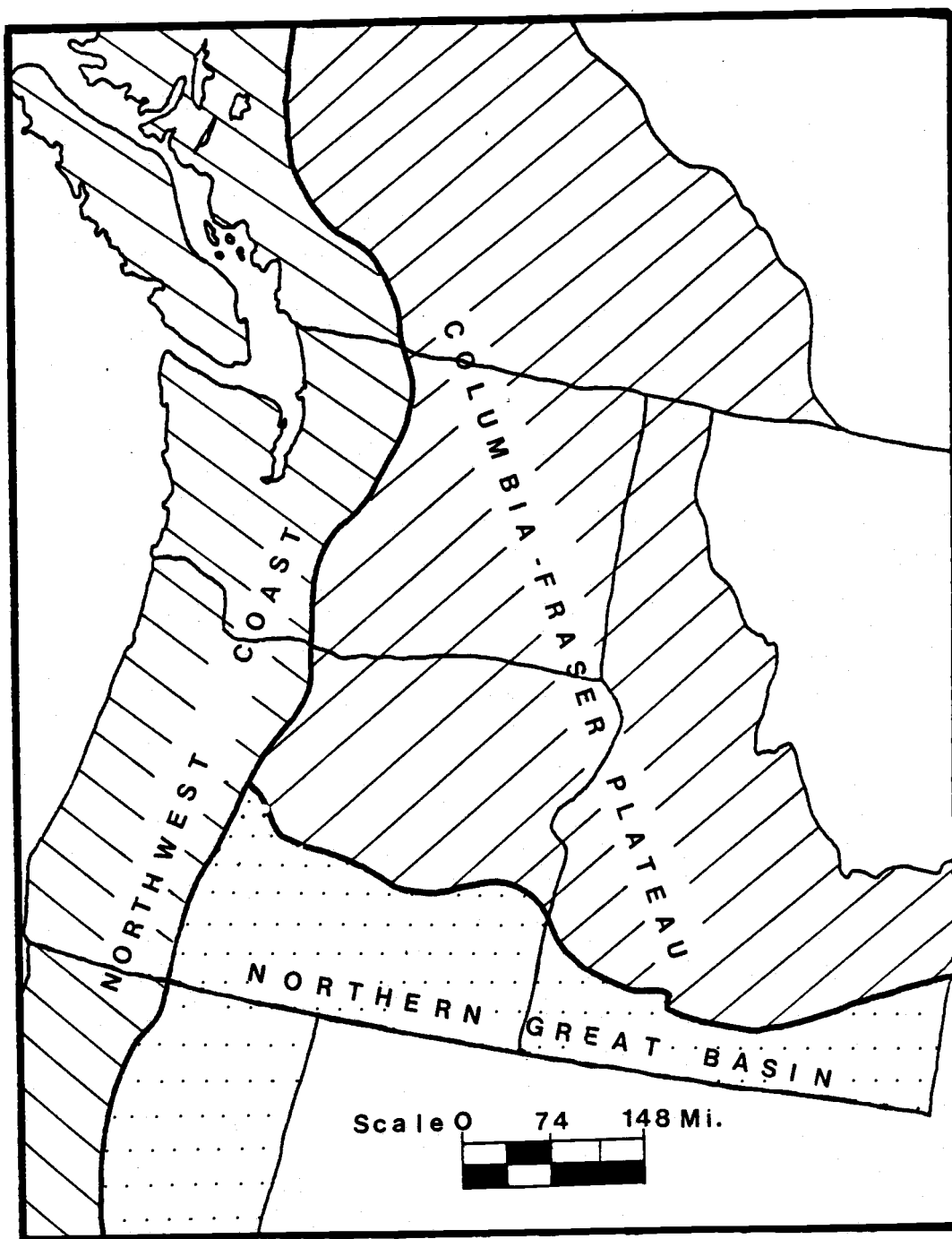


FIGURE 2
Northwest Cultural Regions Within the Project Area
(after Kroeber 1939)

In the sections to follow, ethnographical and archaeological data concerning the native use of thermal springs in the Pacific Northwest are presented. Section II consists of a brief outline on the origin and composition of thermal springs throughout the Northwest region. Section III describes the physiographical boundaries of and the human settlement and subsistence patterns found in each of the cultural regions of the Pacific Northwest as they would relate to the distribution and availability of thermal springs. A review of the available ethnographic literature is presented in Section IV detailing the use and importance of thermal springs to the Northwest native population. This information is employed in projecting regional patterns of use that became apparent during this analysis. Section V is comprised of a compilation of archaeological and ethnographical data on specific spring sites located throughout the project area. The sites included were selected using a stratified random sample so as to present information that could be used in determining possible regional variations in site use. Section VI presents the current developmental status of thermal springs throughout the Northwest region and details several Native American environmental and spiritual concerns over the development of geothermal resources. A summary of the information contained within this thesis is presented in Section VII.

II. ORIGIN OF THERMAL SPRINGS

Thermal spring waters have a temperature of more than 5°C or 10°F above the mean annual temperature of the region in which they are located. The water may or may not carry more mineral matter than the common potable waters of the region. Those having water temperatures higher than 90°F are classed as hot springs and those higher than the local mean annual air temperature but lower than 90°F are called warm springs (Souther & Holstead 1973, George 1920). The interior of the earth is very hot as proven by the issuance of lava from volcanoes, by higher temperatures at the bottom of deep mines and by the heat of waters from hot springs and geysers. A large portion of springs of all kinds (thermal and nonthermal) are fed chiefly by waters that have fallen upon the earth as snow, rain or other forms of moisture and have entered the earth by seepage through pores, fissures and fractures in the rocks (see Figure 3:page 9).

The distribution and character of thermal waters are closely related to regional topographical and geological features. Each physiographical region is underlain by distinctive rock types and structures that control the

temperature and quality of water issuing from springs and wells (Southren & Holstead 1973). The majority of hot springs are found in mountain regions and in regions where volcanism exists or has recently existed. Crustal movements producing frictional heat and volcanism are believed to be responsible for the high temperature of the majority of hot springs.

The western United States (Alaska, Washington, Oregon and California) and British Columbia constitute a part of the so called "Pacific girdle of fire", a tetonically-active plate marginal belt marked by volcanism (Bowen 1979, McDonald 1978). After volcanic eruptions, lava remains hot beneath the earth's surface for a long time. Surface waters flowing underground through rock fractures and fissures are heated by conduction from the underground mass of lava. This superheated water (water at temperatures above the boiling point which, because of pressure, does not vaporize into steam) either comes to the surface where it changes to steam, or mixes with cold water and comes to the surface as a hot spring (Figure 3).

A large portion of springs in Nevada, Utah and southern Idaho are known to obtain their thermal water from underlying older formations and are directly related to faults. Underlying parent magmas exist to which major

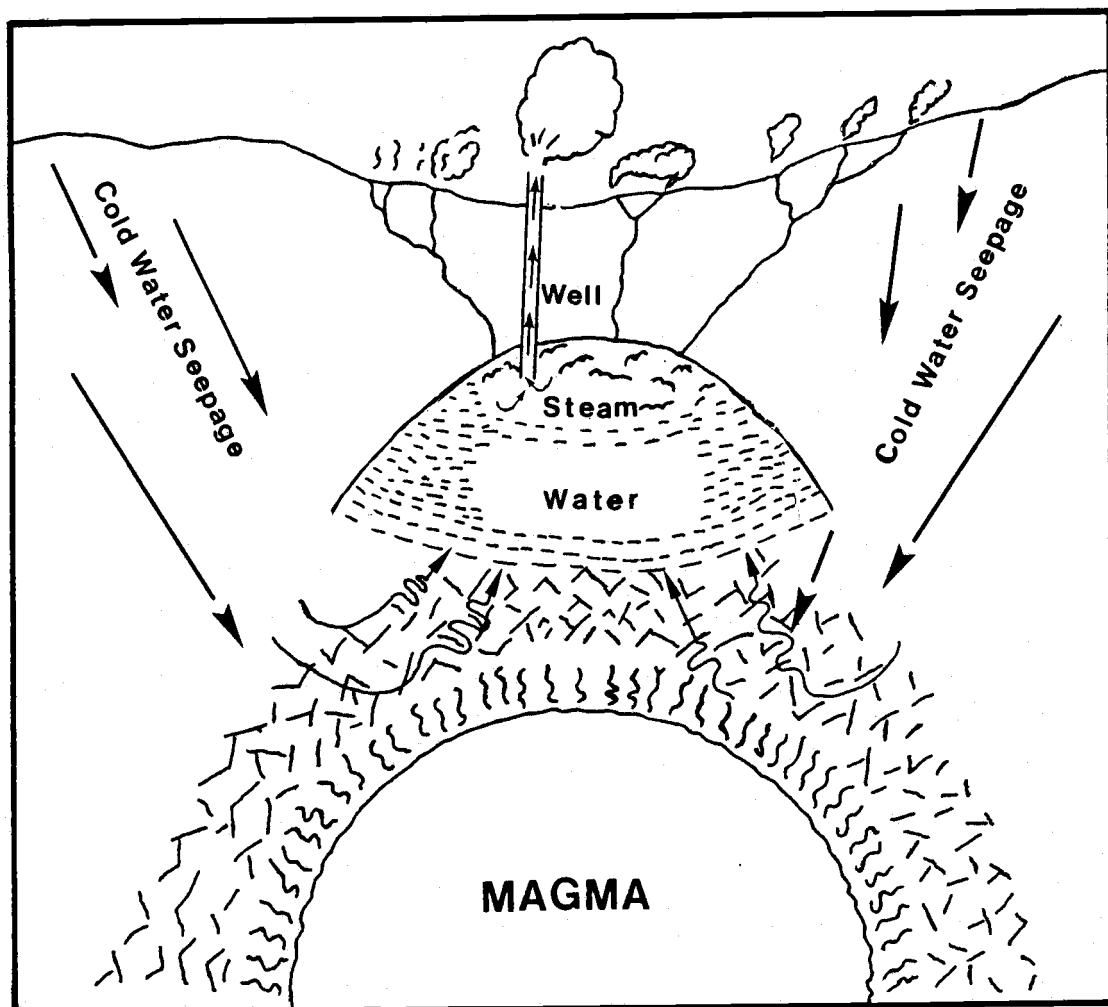


FIGURE 3

Origin of Thermal Springs (after McDonald 1978)

faults may extend and from which the heat of the thermal waters may be derived (Meinzer n.d.).

Each spring is unique in its own ecosystem (McDonald 1978). In some spring areas there are plants found nowhere else in the United States or Canada. Each spring deposit consists mainly of tufa [Calcite, CaCO_3 or $\text{CaMg}(\text{CO}_3)_2$]. Calcite has the potential to precipitate out of solution and fill in cracks in the rocks, eventually leading to the sealing off of the natural hot springs. At many hot springs, the tufa, close to the spring source, is replacing the moss and other vegetation, thereby forming perfect mineral replicas of the living organisms.

A thermal spring can play a major role in developing its own microclimate. The effects of warm water and a sheltered location have been found to cause a surprising change in the local flora over a very short period of time. After the construction of the Pelton Dam near Madras, Oregon, seven new thermal springs appeared around the parameters of Lake Simtustus. The typical low desert plant community of the area consisted of bunch grass, rabbitbrush, sagebrush and juniper. Fifteen years after the springs' appearances, the flora had drastically changed. Low desert plants still occupied the slopes to within 30 meters of the springs but the flora in the immediate vicinity was similiar to Cascade province types.

Plants growing by the springs included sword fern, willow, wild raspberry, elm and a luxuriant growth of miner's lettuce (Ashwill 1982).

III. PACIFIC NORTHWEST CULTURAL REGIONS

The physiographical boundaries of and the human settlement and subsistence patterns found in each of the cultural regions of the Pacific Northwest are described in this chapter. This information provides insights to the interrelationship between seasonal transhumance and thermal springs.

Plateau Region

Physiographically, the Southern, or Columbia Plateau, is an area of highly varied topography. The area extends from the essentially flat central Columbia basin, east into the Rocky Mountains of Idaho and Montana, south to the Blue Mountains, west up the slopes of the Cascade Range and north to the Okanogan Highlands. The annual rainfall in the lower Columbia and Snake River valleys is 10 inches or less with an increase of up to 30 inches in the higher elevations. Most of the precipitation falls in the winter months in the form of heavy snowfall in the mountains, often resulting in severe winters.

Human settlement patterns were focused along the rivers. The rivers were important because of the presence

of salmon and other fish for subsistence, the mild weather of their valleys for winter settlements, of the driftwood readily available for fuel, and of their value as transportation routes. The majority of villages were strung out along the major waterways which provided a flowing network that permitted intergroup contacts (Anastasio 1975).

Subsistence activities varied from group to group and area to area. Resources were obtained by hunting, fishing and gathering food items during the seasons when each was more readily available. Plant materials (roots and seeds) constituted one-third to one-half of the Plateau diet (Anastasio 1975: Hunn 1982). Roots and bulbs from camas, kouse and bitterroot formed the bulk of the plant diet with a variety of nuts, berries and seeds also being used. Root crops offered a dependable resource which could be relied upon even in the worst of years.

Fishing was another important subsistence pursuit providing from one-third to one-half of the yearly food supply. Salmon, being the most prolific and favored fish resource, offered a dependable food source in most of the Plateau (Hewes 1947). The harvesting of salmon took place during different times of the year depending on the geographical location. Fish other than salmon were obtained

by most groups with some fishing being possible throughout the year.

The hunting of large game animals (deer, antelope, elk, bison, mountain goat and sheep) made up a considerable portion of the winter food supply. These animals were utilized not only as a food source but as a source of raw material for clothing, shelter, and other items as well. Hunting was much more variable than either fishing or gathering since animal populations fluctuate according to ecological conditions (Anastasio 1975). Winter villages were often situated in areas likely to yield sufficient game that could be used to meet the added subsistence needs throughout the colder months. Those groups having relatively poor hunting sites in their native territories, co-utilized neighboring areas with other groups and acquired hides and finished ornaments through trade.

The seasonal round of hunting, fishing and gathering commenced in the early spring with the harvesting of root crops and the arrival of the salmon. People continued to move about throughout the warmer months gathering plant material and hunting in the higher elevations, and harvesting root crops and fishing. Several fishing, hunting, root gathering and berry picking sites were visited to prepare food for winter use. Autumn was spent

gathering nuts, berries and other crops along with increased hunting, particularly of bison, for the more eastern groups. Winter was essentially a sedentary season; with subsistence based largely on food caches that were prepared during the summer months and secondarily on winter hunting. Hunting was most important during the early winter months and would taper off toward the end. If the winter hunts failed for any reason, small parties were forced to move out to hunt and gather emergency food supplies. Winter was the most sacred season of the year for Plateau peoples with very little travelling and socializing being done compared to the rest of the year. The subsistence cycle would begin again with the first appearance of the salmon and root crops.

Thermal springs are located throughout the Plateau region particularly along major river drainages near mountainous regions which were utilized for subsistence purposes throughout most of the year depending on the elevation and relative topography of the springs. However, heavy snowfall throughout the mountainous areas had a limiting effect on the use of these springs during the winter months.

The Northern Great Basin

The Northern Great Basin Region includes south central Oregon and the adjacent topographical areas of California and Nevada. Geographically, southern Idaho fits into the Columbia Plateau Cultural Region but since culturally the region is very similar to the Great Basin (Aikens 1982) it will be included in this discussion. Northeastern California and the territory around Klamath Falls share many cultural and topographical features with the Northern Great Basin and thus their areas will also be included for the purpose of this study. In an attempt to narrow the boundaries of the area being studied and to include only those areas generally referred to as the Pacific Northwest, Nevada will be excluded from this analysis. The topography of the northern half of the northern Great Basin belongs to the High Lava Plains Province and is dominated by gently rolling terrain formed by lava flows. The average ground elevation is approximately 3900, feet with occasional cinder cones and lava buttes. The southern half is comprised of typical basin and range topography with elevations spanning 3900 feet on the valley floor to 9800 feet in the mountainous regions. The general climate of the region is characterized by light precipitation, plenty of sun light and an extreme variance in daily and seasonal

temperatures. The winters are usually wet and the summers very dry.

The basic settlement pattern associated with most Northern Great Basin groups is similar to that of the western Shoshoni as described by Steward (1938:232). He observed that the Western Shoshoni winter villages were located in the mouths of canyons, in the pinyon/juniper zone or in broad valleys near fishing streams.

But whether they were scattered at intervals of several hundred yards to a mile along streams, were situated at springs on mountain sides or were clustered in dense colonies depended on the quality of foods which could be gathered and stored within a convenient distance of each camp. In some places, families had to camp alone; elsewhere, as many as 15 to 20 could congregate in a true village (Steward 1938:232).

Independent families generally served as self-sufficient economic units that would spend the greater part of the year harvesting available resources within a 20 mile radius from the winter village. Sometimes an area of at least 100 miles in diameter was covered during the seasonal food quest (Malouf 1966). After the harvest season, the families would return to the winter village site and remain there until spring.

The population of the northern Great Basin subsistence cycle relied on broad-based plant foraging, supplemented by hunting and occasional fishing. Seed

products, especially pinon nuts (where available), were the most important food item to be gathered by the Great Basin people. Local and yearly variations often made the availability of root crops unpredictable. Hunting was based primarily on the procurement of small game animals, birds, rabbits and antelope. Drives for rabbit and antelope took place infrequently, and required intergroup cooperation. Fishing was conducted along streams and lakes but never provided a major food base. Seeds and root crops were first harvested in the early spring when the desert began to show green. Women and children would forage among the desert bushes for roots while the men attempted to net feeding ducks in areas where they were present. The fish would begin to run near early May in those areas having sufficient amounts of fresh water and their spearing and drying would often occupy the entire family (Wheat 1967). Desert seeds would be ready for harvesting by early June. The foraging unit (family) would travel as far as necessary to locate and harvest the available seeds, roots and berries. In good years this wouldn't take them very far from their winter village site but in years of less abundance, the family would have to travel many miles to gather the necessary food items.

The summer harvest focused around the gathering of Indian Rice Grass, seeds, roots and any available

berries. Fall subsistence pursuits centered around the harvesting of pine nuts, where available. Other species of seeds would be collected and communal antelope and rabbit drives might be undertaken (Armitage 1983). With the approach of winter, semi-permanent tule-mat or hide covered houses would be built near streams or marsh lands. During the winter, subsistence was based on stored foods, occasional hunting and the gathering of what seeds and roots could be found.

The majority of the thermal springs found in the Northern Great Basin occur along major faults which bind the mountainous regions. Many of these hot springs are surrounded by extensive marshes that have been created by spring runoff. These marshes vary in size from a few acres to several square miles and provided a wide range of resources. Thermal springs provided the inhabitants of this region with camping locales throughout the year, particularly during the winter months when a source of fresh water and food resources were essential.

The Northwest Coast Region

The Northwest Coast Region stretches from southeastern Alaska to the redwoods of northern California, with the Cascade Mountains forming the eastern boundary and the Pacific Ocean the western. The

area is made up of several physiographical provinces each having distinctly different characteristics and geological histories. These provinces include the Coast Range, the Cascade Range and the fertile valley land that lies in between. The region is bisected by several major drainage systems, chief among them being the Frazer, Willamette, Umpqua, Rogue and Klamath Rivers. The area is characterized by a cool moist climate with relatively wet, mild winters and warm, dry summers. Area fluctuations are influenced by the region's proximity to the Pacific Ocean and the general topography. Most precipitation falls from November to March, resulting in heavy snowfall in the higher elevations of the Cascade Range.

The settlement patterns of the region was primarily along the various rivers, beaches and fjords. The subsistence base of the many native groups was very diverse requiring them to make use of a variety of lowland, upland and riverine habitats. The majority of the year (6-8 months) was spent traveling from open camps while they gathered available subsistence resources. In the fall they would retire to permanent winter village locations before the rains began.

Subsistence activities varied from area to area and group to group. Subsistence resources were obtained by

gathering root crops, seeds and berries; fishing; harvesting ocean resources (clams, mussels etc.); and hunting large and small game. The relative importance of each subsistence activity varied depending on a group's location. Native groups occupying land along the Pacific Coast obtained most of their resources from the sea. Fishing and the harvesting of ocean resources took place throughout the year. The collecting of berries, nuts and insects took place during the warmer summer months and helped supplement the diet. Root crops (wapato and camas) and hunting (deer, elk, waterfowl) all helped add variety to the coastal diet but never constituted a major subsistence resource (Drucker 1943, Olson 1935, Spencer, Jennings et al. 1965).

Native people occupying the fertile valleys that lie between the Coast Range and the Cascade Mountains also had some dependence on fishing resources and tended to cluster around the major drainage areas. Fishing in local streams, rivers and lakes occurred throughout the year. The harvesting of acorns and root crops, such as camas and wapato, made up the largest portion of the native diet. These root crops were available from March to October, growing in such abundance that they could be collected and used as major articles of trade. A variety of nuts and berries became available throughout the midsummer-fall period. Hunting provided additional food

stuffs with the majority of large game (deer, elk) being taken during the winter months, though waterfowl were caught all year round (Beckham et al. 1981, Sapir 1907, Suphan 1974a). Subsistence resources for this areas were fairly dependable and predictable. Food items could usually be gathered in surplus and used as articles for trade between other native groups.

Indians residing in the foothills and mountainous regions of the Cascades (Molalla, Upland Takelma) subsisted primarily on resources obtained by hunting. These groups wintered in areas along streams in the lower elevations and exploited the higher country for large game (elk, deer, bear), roots and berries during other parts of the year. They fished for salmon, steelhead, trout and other species of fish in streams and lakes throughout their territory. In 1853, Joel Palmer notes that Molalla subsistence was based primarily on wild game while numerous mountain streams and lakes provided a rich supply of fish (Palmer cited in Coan 1922). Animal products (buckskins, dried meat) were traded to other groups for food items and beads (Spier 1930; Zenk 1976; Beckham et al. 1981).

The majority of the thermal springs located in the Northwest Coast Region lie in the foothills and mountainous regions of the Cascade Mountains. This

region's subsistence resources (berries and large game) would have been utilized by the valley and mountain native groups during the spring through fall periods. The snowfall throughout this region is often very heavy limiting the use of this area during the winter months. Because of the high elevations of most of the thermal spring sites, the severity of the winters and the seasonal subsistence patterns of the inhabitants of this region, it is believed that the springs located throughout the Cascade Range would have been predominantly utilized during the spring, summer and fall.

(Table 1 on p.201 graphs the major subsistence resources and social organization for each of the Northwest cultural regions)

IV. ETHNOGRAPHIC REVIEW

The greatest criticism one can make of the many attempts to interpret man's past is that they project onto the visual world of the past the structure of the visual world of the present (Hall 1969:81-82).

A review of the ethnographic literature was undertaken in an effort to gain as much information as possible on the uses of natural thermal springs by Native Americans throughout the Pacific Northwest. These ethnographic accounts included the few works done by early ethnographers in the Northwest (i.e., Boas, Steward, Spier), journals of early explorers and trappers (Lewis and Clark, Work, Thompson), travelogues, diaries, and written accounts by Euroamerican thermal spring owners. This information was gathered in order to compile a record of spring use based on observed behavior. In order to gather as much data as possible, a lengthy search of many sources throughout Oregon, Washington, Idaho, northern California and British Columbia was conducted. These sources included the library facilities of state, local and university libraries; historical societies and museums; archival centers; federal agencies (National Forest Service, Bureau of Land Management); and various university archaeological personnel. Correspondence and personal visits with many of the

owners of thermal springs were conducted in order to gather as much information on the known history and use of various springs.

The following sections discuss the various observed uses of thermal springs by Native Americans. When possible this information is employed to project regional usage patterns. This data's then combined with the known settlement and subsistence patterns of the Pacific Northwest cultural regions in order to evaluate the role thermal springs might have had on influencing prehistoric lifeways.

Hunting

The strong attraction to thermal springs by large game animals (deer, elk, sheep, bison) has been noted by most of the early explorers and trappers throughout the Pacific Northwest. Robert Stuart in 1812 (Rollins 1935) and John Jacob Astor's fur company employees in the 1820's (Irving 1950) record seeing elk horns strewn in every direction around hot spring ponds while Lewis and Clark in 1805-1806 (Thwaites 1959) made note of the many deer and elk roads leading to hot springs. This attraction is chiefly due to the mineral composition of the thermal spring waters and the effects of the thermal heat on an areas biotic environment.

A mineral component of most thermal springs is Sodium (Na). The high temperature of thermal waters beneath the earth's surface dissolves most mineral matter and holds this matter in solution. A fall in temperature, such as that caused by the contact of the thermal water's with the cooler atmosphere, causes the precipitation of salts, held in solution at higher temperatures, thus creating a natural salt lick (George 1920, Carrey 1978, Hill 1983).

During the winter, ground heat created by thermal springs melts snow and uncovers buried grasses. Herbivores (deer, elk and bison) are attracted to these snow free winter grazing areas, often making the difference between herd survival or decimation (Meagher 1971). Studies on elk (Cole 1976), deer (Russell 1932), and bison (Meagher 1973) emphasize the role of thermal springs in certain areas during seasonal game movement. Thermal phenomena (springs & geysers) cause tracts of land to be entirely free of snow and the warm waters of brooks and larger streams encourage the growth of moss and grasses along the banks throughout the winter. These plants provide a dependable food source within certain limits, often making it unnecessary for deer and elk to migrate. Bison are apparently attracted to thermal areas only during the winter months (Meagher 1973).

Game animals are considered a diffuse resource. A hunter can only predict the location of these animals with some degree of certainty within a broad range area. During much of the year, the exact location of a herd at any one time is highly unpredictable. In the winter, however, large game are known to congregate in thermal areas. This attraction heightens the predictability of herd movements during the winter months. Thermal spring

areas generally only cover a small tract, limiting the amount of range land where exposed grasses are made available. Thus, a diffuse resource becomes predictable (Samuelson 1981).

Brooks (1980) analyzed a site surrounding a series of warm springs, located in Central California. It consisted of sixty stone hunting-blinds that were built overlooking or adjoining existing game trails leading to the thermal springs. These blinds were built anywhere from several meters to 130 meters from the trail with the majority located 20 meters away. The greater distance from the springs, the further away the blinds were built from the gaming trails. Two possible explanations for this positioning are: 1) the features farthest away from the spring (thus further from the trail) were observational outposts while those closest to the springs served as the actual ambush locations; 2) those features farthest from the springs were also used as ambush locations aimed at killing an animal in cases where the herd was alarmed before reaching the spring area. Both explanations emphasize the importance of thermal spring areas for the hunting of large game (in this instance, predominantly bighorn sheep). In desert areas this attraction would hold true for any spring, not just those that are thermally-heated, due to the scarcity of water.

Thermal springs provide running water the year round, since they are not affected by freezing winter temperatures. They also provide a natural salt lick as previously described. In central Idaho, three hunting blind sites have been recorded overlooking thermal springs (Idaho SHPO 1983).

Samuelson (1981) suggests that prehistoric peoples occupied sites near thermal areas during periods of the year when game was abundant. Winter is the only time of year herbivores are especially attracted to thermal areas. The majority of archaeological sites found in close association with thermal springs are campsites yielding a high percentage of projectile points. This high number of projectile points suggests that a large portion of subsistence was based on hunting. In most of the cultural regions of the Northwest, hunting played a major part in subsistence activities only during the winter months. However, prehistoric peoples were probably not attracted to thermal areas because of the available plant resources; a wide variety of species were available, but none were abundant.

Thermal springs occurring near a river or channel of water provide an ice-free location for waterfowl to alight during the cold winter months when lakes and

streams elsewhere are frozen (Howe 1968). This ice free water also permit fish to remain in the area throughout the winter (Spier 1930).

Thermal areas located in extremely high elevations were less desirable to prehistoric inhabitants as a hunting locale. Most game animals migrate to lower elevations with the approach of winter. The available resources (grasses) can only support a small number of large ungulates.

Therapeutic Use

Ethnographic literature concerning Native Americans reveal that the thermal waters, taken either internally or applied externally by soaking, were thought to help cure arthritis, rheumatism, stomach & kidney troubles, injuries and, after the arrival of early Euroamerican settlers, thermal waters were used to recover from the effects of excessive alcohol and to cure syphilis, malaria and other European introduced diseases. The method of treatment varied from spring to spring, with some springs being thought more valuable for treating illnesses than others even when they might exist only a few miles apart. A difference in taste, odor and temperature between waters of various springs was

obviously recognized as important by the natives. They had no scientific explanation for the unusual taste, temperature and odor and most probably assumed that powerful spirits dwelled in the water or that the water was a rare gift from the spirits. Weslanger (1973:102) discovered an early account written by a Dutchman visiting New Netherland on the East Coast of North America in 1656, where he wrote:

"The Indians inform us that there are other waters in the country differing in taste from the common water, which are good for any ailments and disease" (Collections, New York Historical Society 1841:46).

It is understandable why thermally-heated waters were thought to be medicinal because of the warmth and relief they gave. Native inhabitants' lifestyles were interwoven with the environments, thus the discovery of sources of hot water would certainly have been incorporated into those lifestyles.

The most comprehensive study involving the bathing practices of a Native American group was done by Deward Walker (1966) when he described the "sweat bath complex" as practiced by the Nez Perce. This complex is made up of four related Nez Perce customs; the hot water bath, the cold water bath, the emetic stick and the sweat bath. These four practices are combined into one complex due to several factors. When members of the Nez Perce culture

speaking of one of these practices they always mention the others along with it. Before the coming of the Euroamericans, the tendency was to practice all of these in a single prepared area for the similar purposes of cleansing, conditioning, curing and recreation. The two customs of primary interest to this study are the hot water bath and the sweat bath. Hot springs have been used in conjunction with each of these practices.

The hot water bath is believed to be the older of these practices (Bailey 1935). The construction of the bath involved excavating a hole in which to bathe, usually measuring 6'-7' long, 4'-5' wide and 3'-4' deep. These baths were located downstream from main settlements and close to a creek or stream so that water could easily be diverted into the pool. Stones, 6"-8" in diameter, were heated in a fire close to the pool and then rolled into one end so that bathers would not burn themselves. As many as twenty rocks would be used, depending on the size of the bath and the number of participants. The bathers first cooled themselves off with cold water and then lowered themselves into the hot water up to their chests. The participants would soak and rub themselves with backrubs often being exchanged among the bathers. Prolonging the bath was considered beneficial with the limit being 15-20 minutes. After leaving the hot water,

the bathers would cool themselves down in the cold water before returning to the hot water bath. This cycle continued for as long as the individual could endure it, always ending in the warm bath (Thwaites 1959:170-171). The Nez Perce made use of a number of natural hot springs which they dammed up to produce the same effect as the hot water bath. One of the hot springs used in this manner is located four miles up Three Mile Creek off the Selway River in Idaho (Stuarts Hot Spring) and is known to the Nez Perce as Piyuq'i.spe (Walker 1966). Another spring that was used in this manner was seen by Lewis and Clark (Boyles Hot Spring). At this spring the Indians had dug a hole into which the nearby hot water could be diverted (Thwaites 1959 3:64).

In areas where stone pools could not be constructed (i.e., Harrison's Hot Spring in British Columbia), Indians would draw up their canoe close along the side of the springs, unload it and beach it in the soft mud. The canoe would then be weighed down by a couple of good size boulders and dipped full of hot water. Lake water was added if the temperature needed to be lowered. Often they would place a blanket or tarpaulin over the top of the canoe to increase the sweating (Findlay 1932).

The purpose of the hot water bath was more spiritually oriented than any of the other customs incorporated into the sweatbath complex. Among the purposes for which it was used include cleansing those menstrually polluted or those polluted by a corpse. Another was its use before the winter spirit dance so as to be presentable to ones tutelary spirits. The hot water bath was thought to have both attuned and conditioned the power obtained from the spirits. The activities that the hot water bath were associated with were considered extremely dangerous, required great strength and courage and were necessary for the continued existence of the society. These activities included horse stealing, gambling, war and hunting. The use of the hot water bath was considered to be a means of developing the individual resources needed to accomplish such tasks. If the individual carefully cleansed himself in the hot water bath, it was thought that he could go through enemy lines without detection.

The reduction of health and death anxieties is a universal problem for which all cultures attempt to find a solution. In the Nez Perce culture, the hot water bath contributed notably to this end. The hot water bath was significantly a male-dominated practice but not entirely. The water was supposed to have curative powers: attempts

were made to cure a paralyzed woman and were also used by women after menstruation and childbirth (Walker 1966). Its primary use after menstruation and childbirth was cleansing but it was thought to be beneficial for its curing affects after childbirth.

The use of hot water baths as a treatment is a very old practice. Bathing in the hot water was thought to be especially beneficial for curing rheumatism, arthritis and skin diseases. Mention is made of its curative powers in Nez Perce mythology, being used to heal skin irritations and sores (Phinney 1934:485). Lewis and Clark documented its use in healing the few disorders that plagued the Indians (Thwaites 1959 3:106).

The use of the hot water bath disappeared among the Nez Perce due to the effects of cultural changes that eliminated the use and functions which this practice once served. These changes provided new ways of satisfying the traditional uses and functions served by this practice. Unless a custom begins to serve new uses and/or functions when its former uses and/or functions have been eliminated, it will tend to disappear from the culture from which it was a part.

By containing the Nez Perce on a reservation between 1855-1877, opportunities for warfare and horse stealing were minimized. The Bureau of Indian Affairs and the missionaries on the reservation also exerted strong pressure to stop the practice of gambling. Fear of the dead and sorcery were reduced because the missionaries developed skepticism among the Indians towards their former supernatural beliefs and assertions that God provided adequate protection against evil forces. Hot springs that were located and used within Nez Perce territory were denied them as commercial developments were established at those springs that catered only to the Euroamerican settlers. The wide-spread adoption of Euroamerican medical techniques contributed to a decline of Native American healing practices.

Today, bathing in hot springs is still viewed by many Native Americans as a method of healing and purification. Rolling Thunder, an Indian spiritual leader, considers natural hot springs to be a sacred place of purification which is the first step towards accomplishing any endeavor. One cannot purify the body without also cleansing the mind and the proper use of the natural springs is one method of purification (Boyd 1974:96-100).

Another method of medicinally using the waters externally was accomplished by the use of a mud bath. Indians would often bury themselves in the hot mud along the spring runoffs. This practice was considered a valuable treatment for skin disorders and was used at springs throughout the United States (Stone 1892, Lund 1979, Horowitz 1973). Specific uses of the healing mud included its use in inducing fever to heal smallpox (i.e., Breitenbush Hot Springs, Oregon) (Harper 1985), its help in drying out poison oak (i.e., Klickitat Springs, Washington), and as an application to horses to relieve sore feet, abrasions and abscesses (i.e., Foley Hot Spring, Oregon) (Runey 1985).

The spring water was often taken internally to aid in the treatment of stomach, kidney and digestive disorders. Upon leaving a spring area, water would often be collected and carried with the Indians to be used later when they might be in need of its medicinal qualities. Pellets were often made from the mud of thermal springs to be taken internally at some later date for its medicinal properties (O'Harra 1967). This concept of sacred water or clay having the power to cure or aid an individual or groups is similar to the beliefs held in many parts of Europe and Mexico where water from a spring carries power to alleviate ailments and gives strength

and protection. Plain soil or water from just anywhere does not have this power.

The practice of sweating, as a major medicinal treatment to purge any internal poisons, was common throughout indigenous western North America. A sweat lodge or sweat bath would be used to cleanse the body of almost any illness. Its positive effects in treating most early diseases encouraged the spread of this practice. It wasn't until the introduction of Euroamerican's diseases that the treatment failed to bring positive results. In the case of small pox and like diseases, the strain on the body by the alternating hot and cold treatment probably enhanced the effects of the illness which helped decimate a major portion of the native Northwest population.

Hot springs, offering a natural source of heat and steam, were incorporated into the sweat lodge practice. The earliest account of hot springs being used for this purpose was recorded by Garcilosa de la Vega, an early explorer, who along with DeSoto in 1541 reached a natural spring near the Gulf of Mexico (Hot Springs Arkansas ?).

He wrote that (Alsopp 1931:148-149):

The fame of this valley and these healing waters was known far off, and even the Cherokees came from their mountain homes to bathe in the hot pools and steam in the skin houses that had been built over the smaller springs....The friendly natives also began to stretch additional wigwams over the hot pools for the use of the travel-worn strangers.

A more recent account of this type of hot spring use within the Pacific Northwest was recorded by Durham Wright, the founder of Medical Springs Resort in northeastern Oregon.

They [Indians] built a number of little dams across the small stream that runs from the springs and they made the water about 20" deep. They put willow sticks around the edges and stretch a big elk hide or blanket across the top to keep the steam in. Then they would crawl in like a dog and lay there until their meat was almost ready to drop off. Would run out and jump in a cold stream. Then would wrap himself up in a blanket and lay down by a tepee to almost melt. The perspiration would run off of him in a stream (Wright 1975).

The sweat bath as used by the Nez Perce is usually described as consisting of three types: the semi-subterranean, the dirt covered and the skin or mat covered. "The type in use at the moment was largely a function of the type of settlement, this in turn being a function of the season" (Walker 1966:137). A fourth type or adaptation of the above three types is described by the National Forest Service. This style is described as

the construction of small huts over hot spring pools which were used as sweat baths (Bradley 1978). How widespread this practice might have been is unknown but its use on Sweathouse Creek, a tributary of the East Payette River in Idaho, has been recorded as well as at several other locations dispersed across the Northwest.

The major functions of the sweat bath as described by Walker (1966:149) are five fold:

1. A source of group solidarity among Great Basin peoples and those of the Northwest Coast. When an outsider wished to enter a village he would always seek out the sweat bath and make his contacts there under the obligatory friendly conditions.

2. Reinforcement of the groups social organization. A different sweat bath was usually maintained for each sex to limit the chance of possible menstrual pollution, but occasionally men and women would use the same sweat bath, although at different times.

3. Contribution to the cultures religious and medical activities (i.e., as a place of religious observance or curing).

4. Contribution to social control. The sweat bath served as a gossip center for the group and a shaming center for those who would break the group's mores.

5. Contribution to the acculturation of the children. Both male and female children were introduced to the sweat bath at an early age as it was considered a vital part of their early training. During the sweat bath, lecturing and recounting myths would be done with an emphasis placed on developing physical strength and endurance. "This early training was thought to be directly connected with the satisfactory performance of most important adult roles such as hunter, warrior, wife,....

Information on the various applications of the thermal springs environment by Native Americans is sparse and doesn't seem to focus on any one area. See Figure 4 for a regional distribution of springs in the Pacific Northwest known to be used medicinally as hot water baths, mud baths, sweat baths and internal treatment. Table 2 (p. 202) records site specific information on those springs known to have been used medicinally in this region.

Another more unusual method of healing incorporating thermal springs was noted in southwestern Oregon in the use of Buckhorn (Emigrant) Springs. This spring (68⁰F) emits carbon dioxide into the air which, being heavier than the normal atmosphere, tends to settle and form a

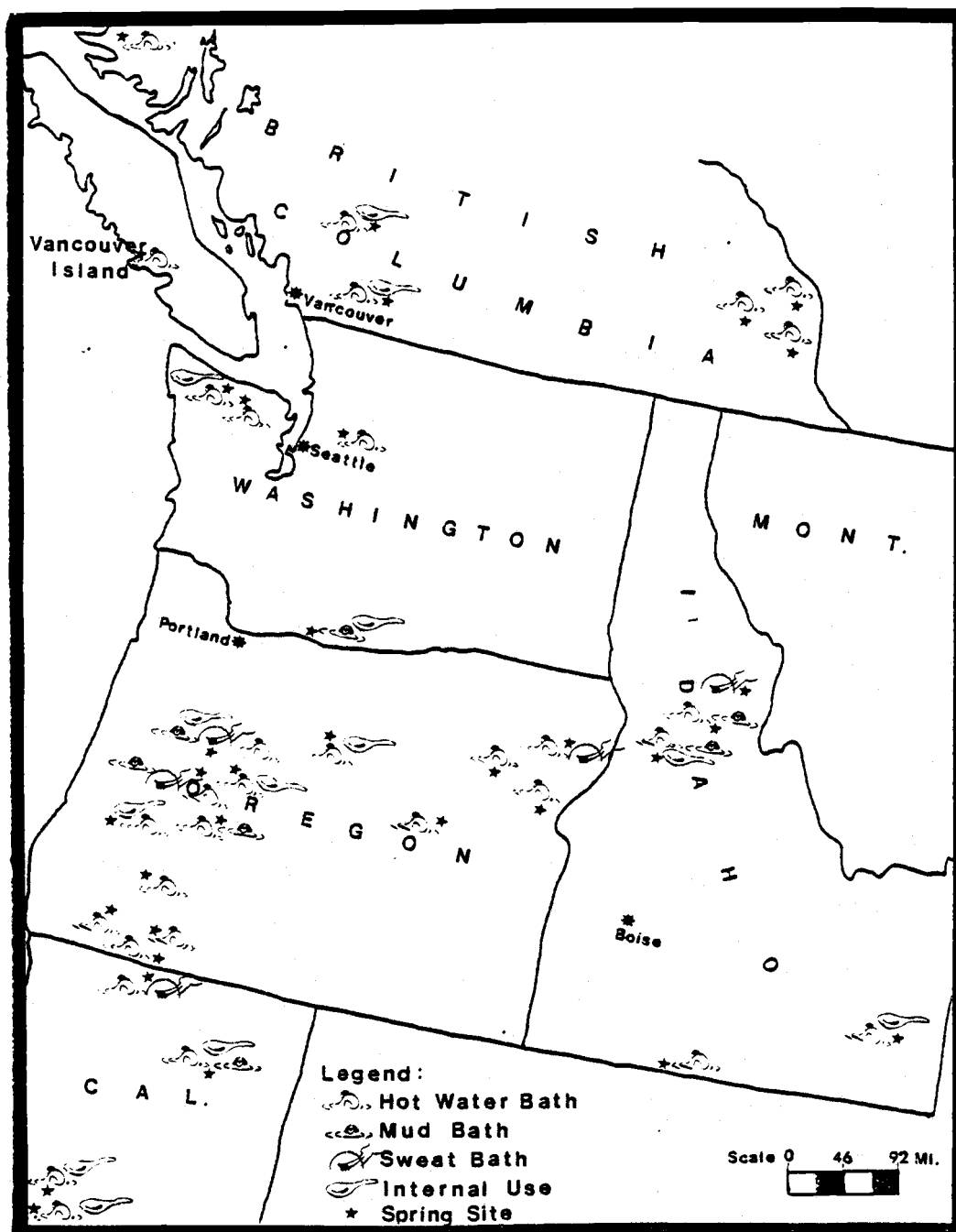


FIGURE 4

Distribution of Medicinal Use of Thermal Springs

layer above the ground. These gases were said to be a manifestation of the breath of the Great Spirit. The Klamath and Takelma built "flimsy wickiups" of fir boughs over the rock crevices and placed the patient in a comfortable position to inhale the vapors. When he became unconscious, he was removed to a safe distance to regain consciousness. His circulation was restored by rubbing and in a day or two the procedure was repeated until the illness subsided (Horowitz 1973:9-10, Medford Mail-Tribune 3-26-1948). The early white settlers referred to the spring as "poison water" until they learned how to use it by observing the Indians. Two crescent-shaped mounds that were visible in 1974, were said to be the remains of old Indian baths at the site.

Archaeologically, it is hard to substantiate the use of hot springs within this complex. Often when a hot spring would be used for a hot water bath a hole would be excavated where the water could be diverted into it for use. Excavations around the vicinity of the hot springs could turn up evidence of such a hole being dug and its use implied from known ethnographic accounts. The major difficulty with this type of evidence is that similar holes might have been dug by the early Euro-Americans for their own use of the heated waters, thus a period of occupation could not be determined. In instances where a

hot spring was used as a sweat bath some sign of posts or a frame work might be found during excavation that could be used to confirm its use for this purpose. The excavation might recover wood fragments or reveal a change in soil color that would have resulted from the deterioration of the wooden frame used to cover the hot spring.

Spiritual Purification

Natural hot springs were often employed throughout the West as places of purification and have been associated with tribal rites of passage, childbirth and shamanism (Downs 1965, Harner 1982, Clusen 1980). Among the Washo tribes of California and Nevada both boys and girls were bathed after ceremonies which marked their passage into adulthood. Fathers bathed after the birth of their children but it was necessary for mothers to abstain from bathing for at least a month after delivery. This practice is in contrast to the Nez Perce use of hot springs as a curative bath for mothers soon after childbirth. "Wegaleyo" [spirit beings] often issued instructions to a powerful shaman revealing a special spring or stream to be used for decontamination of sacred articles or for ritual bathing.

Thermal springs were often used by shamans as an entrance into the "Lowerworld". Shamans were said to travel hundreds of miles underground by entering one hot spring and exiting another. This custom was said to be practiced by shamans in many cultures of the world such as the Chepara Tribe of Australia and the !Kung of the Kalahari Desert in Southern Africa (Harner 1982, 1983). This mode of travel using spring site channels is probably a wide-spread concept. It has been linked to legends on a Washington reservation where a horse died at one spring and was later found at another.

Certain thermal springs are often linked with "water babies", powerful spirits that were known to inhabit bodies of water such as lakes, springs, ponds and even drainage ditches. Water babies are described by Downs (1966:62):

...as being two or three feet tall with long black hair that never touches the ground but instead floats behind Water Baby when it walks. They are grey in color and soft and clammy to the touch and possess immense power.

Another story tells of a Washo shaman returning from a visit with a patient stopped at Walleys Hot Springs in Nevada to take a swim. He lost consciousness and a water baby came and took him down into the water where they

arrived shortly in another "country" where the water babies lived. After having emerged from the water, he was led down a path to a water baby settlement where all of the houses were made of obsidian. They were met by twenty female water babies who formed a circle around the shaman and sang songs to him. When it was time for him to return (Siskin 1983:24-25):

The water baby who had brought him took him down to the spot from which they had emerged. She dismissed him with the words "Go back the way you came. You won't get lost now". He dove in and came up by the hot spring.

In many cultures such as the Pueblos of the American Southwest, lakes, ponds and springs are considered very sacred locations because the underworld uses them as access to and from the natural world. The Pueblos for example, went to them to communicate with the spirits. Although communication with the underworld can take place at other locations, there are only a limited number of entry points (Clusen 1980:3-102). But flowing bodies of water are not considered portals between the natural world and the real world.

Not much is known concerning the spiritual beliefs of Northwest Native American groups. The early formation of the Indian reservations, the forced removal of the native people from their native territories and the

suppression of rituals and customs dealing with their spiritual beliefs have all helped to erase any knowledge of the range and diversity of their nation's spiritual philosophies. What little information that remains is known only to a select few of the tribal elders. This knowledge will soon be lost forever if efforts aren't made to save it. Thus it could become yet one more lost aspect of Native American cultural heritage.

Specific Nontheurepeutic Purposes

Thermal springs have been incorporated into almost every facet of the Native American's life. Without having the option to visit a local department store to pick up needed supplies, the early inhabitants of the Northwest had to find a natural resource that could be used to perform necessary tasks or else do without. These constraints led them to experiment with their environment which resulted in the discovery of many practical applications using available environmental features. This practice of experimentation was not practiced solely by the native inhabitants but was likewise adopted by the early Euroamericans who first settled in the Northwest. The early explorers (Bidwell-1842, Scott-1846) immediately realized the value of hot springs for cooking meats and eggs and on the Oregon Trail, grease obtained

from Soda Springs was used to lubricate the wheels of the covered wagons.

Use of the hot springs for food preparation among native peoples include the scalding of ducks and geese in Nevada and the use of the water in removing pitch from pinyon pine cones and seeds (Garside and Schilling 1979). Kitson Spring in Oregon was used in the curing of salmon (Horowitz 1973) while the hot earth surrounding Casa Diablo Hot Springs in California was used to steam caterpillars (Reed 1971). Kelly Hot Springs in northeast California was used to prepare tules for use in basket designs. The hot spring water not only cleaned the tules but it also darkened them to a color suitable for use in a design. This use of hot springs was also observed by Goddard (1924) for Indians along the Northwest Coast who utilized the mud of the sulphur springs to dye their basketry material black. Many of the Pit River groups would journey to Kelly Hot Springs not only to prepare the tules for basketry but also to soak willows so that they would be more pliable for use in basketry construction (Silver & Hunt 1980). Animal hides were cleaned and prepared by soaking them in the hot springs before they were used as clothing. This custom was used in southeastern Oregon, southeastern Idaho and throughout

a large portion of Nevada (McClain 1979, Simmons 1980, Price 1962).

Red oxide produced from springs having a high cinnabar content was used for face paint in Idaho (Moore 1920, Halverson 1971) and in California (Lund 1979), and was used for the making of designs in religious sand paintings in what is now San Diego County, California (Waterman 1910). This source of pigment might have been used in the creation of pictographs, which are often found in close proximity to thermal spring sites. White clay found at thermal springs in Idaho was used "by the Indians for cleaning their clothes and skins, it not being inferior to soap for cleansing woolens or skins dressed after the Indian fashion" (Russell 1834).

Occasionally, silicified stone deposits were found near thermal springs and could be utilized in the manufacturing of tools. Examples of such deposits have been noted in Idaho and Arkansas. Whether these various applications of the spring water and its environment are isolated uses dealing with particular springs or were universally used in a like manner throughout the Pacific Northwest is not known. A more intensive investigation must be undertaken before this question can be satisfactorily addressed. What is known is that the

thermal spring environment offered Native Americans numerous potential services that could and often did benefit their daily labors.

Burial of the Dead

Heizer and Treganza (1944, Maloney 1945) note that the custom of burying the dead in hot springs was practiced by the Paiute of northeastern California and western Nevada "quite extensively". Descriptions of hot spring burials in this area were believed found in the journals of John Work (1832) and Alonzo Delano (1849). John Work discovered a number of human skulls and other bones in Hunters Hot Springs, located a few miles north of Lakeview in southeastern Oregon. Work makes no attempt to interpret the reasons behind the presence of the bones but merely states that human bones were seen. These bones could still be seen at the spring as late as 1945 (Examiner 1945). However, the only reference to bones being found in thermal springs in Delano's account of his overland journey to California was his mention of seeing several cow carcasses that had supposedly stumbled into the boiling waters in their desperate search for water. Human bones were recovered from a hot spring near Cedarville, California by Heizer (1971).

There is no record in the ethnographic literature of any Indians in northeastern California or western Nevada incorporating hot springs as a burial location. All references state that the dead were either cremated or buried throughout this region. The great respect and fear of the dead exhibited by most native groups tends not to support this use of thermal springs which would result in the remains of their dead being visible for many many years.

Kelly Hot Springs, in northeastern California, has been related to mortuary practices of the Astariwa (Pit River). One instance of a winter burial was observed close to Kelly Hot Springs:

An Indian man died and his family, or friends, laid the corpse out on the ground until it froze; they then took it down by the channel of water flowing from the hot spring and pushed it into the mud and covered it with rocks (Silver & Hunt 1980:16).

Other burials similar to the one mentioned have been uncovered from different springs in the same area. During the winter months when the ground is frozen, areas around thermal springs remain free of snow and the effects of freezing temperatures. For those Native groups which practiced the custom of burying their dead, thermal

spring areas, thus, would have often provided the best location for the interment of their dead. Over a number of years, with the effect of water runoff and seasonal erosion, it seems very possible that burials placed too close to the natural spring could become exposed leaving the appearance that the spring itself was used to inter the dead. Given the respect for the dead held by Native American people and the recorded mortuary practices of the Indians of northeastern California and Nevada, this explanation for the appearance of human bones in natural hot springs seems more plausible.

In many instances, mention is made of native groups moving to hot spring locations to reside for the winter or to treat the injured or sick members of their party. Winter was often quite severe throughout the Northwest which resulted in a general lack of food and often death for many of the old and infirm. Many accounts in both the ethnographic and archaeological literature report the existence of isolated burials or established burial grounds within close proximity to thermal springs. The presence of these large burial grounds tend to support a pattern of periodic occupation at these spring sites, most likely during the winter months of the year, or a strong attraction to the area by the Native inhabitants suffering disease or injury.

Rock Art

Rock art sites are often found in close association with thermal spring sites throughout the Pacific Northwest. Rock art is of two basic types: petroglyphs and pictographs. Petroglyphs refer to grooved, incised or pecked rock surfaces. Pictographs refer to designs applied to rock surfaces by means of paint.

Rock art sites can be found throughout the Pacific Northwest but are most frequently located near a source of fresh water. Boreson's (1975) study of rock art in the Pacific Northwest found that forty-four percent of the documented sites were found along the Columbia, Snake, Salmon and Middle Fork of the Salmon River. fifty-one percent were located near other rivers, streams and lakes, with the remaining five percent located primarily in the dry lakes region of south central Oregon. Most but not all rock art sites are found in the general vicinity of winter village sites (Nelson 1973:378-9, Steward 1938:136). Since thermal spring sites have played an important part in the choosing of prehistoric habitation sites, particularly winter occupation sites (Samuelson

1981), one would expect that rock art would be found at such sites.

A variety of interpretations of rock art sites have been proposed over the past century. Petroglyphs in central and western Nevada are believed to be a part of the economic pursuit of hunting large game (Heizer & Baumhoff 1962:239). Picture writing on rocks also is thought to be totems of visitors to a locality (Catlin 1965:246). In addition, it has been suggested that petroglyphs and pictographs refer to personal achievement and experiences, records of visits of individuals, water signs, trail signs, warnings, battles, hunting areas, mortuary notices, religion, dreams and ceremonies (Erwin 1930:42). Map Rock in southwestern Idaho is said to delineate the Snake River and its tributaries from the rock to the source of the Snake River in the Rocky Mountains (Idaho Statesman 1889:3).

North American rock art is generally assumed to have originated from Native American groups whose present day descendents usually claim no knowledge of who created the rock paintings or carvings or for what purpose. No interpretations of rock art sites to date have incorporated the thermal springs they are often found near. In the present study, twelve rock art sites were

identified within a 1/4 mile radius of a natural thermal spring. Additional rock art sites were often found in the general vicinity of thermal springs (1/2-1 mile radius) but due to the distance, their association is more tenuous. Table 3 (p.204) notes the variety of design types recorded at these rock art sites while Figure 5 shows their regional distribution. seventy-seven percent of the sites where designs has been recorded exhibit human and/or quadruped figures such as deer, sheep or bison. Heizer and Baumhoff (1959) believe that the presence of large game animal designs near game trails or favored game locations often played a vital role in the subsequent hunt for these large animals. They believed that these rock art sites were connected with hunting magic aimed at insuring success in the chase and were located along routes of deer and animal migration. In the arid valleys of Nevada and Utah, petroglyphs can be found in close proximity to springs with the purpose of apparently aiding in the taking of animals that would come to the spot to drink.

As has been mentioned, thermal springs have long been recognized as a frequent haunt of large game (Irving 1950, Ross 1975, Thwaites 1959) and the spring areas importance as a winter foraging area has been well-documented for elk (Cole 1976), mule deer (Russell 1932)

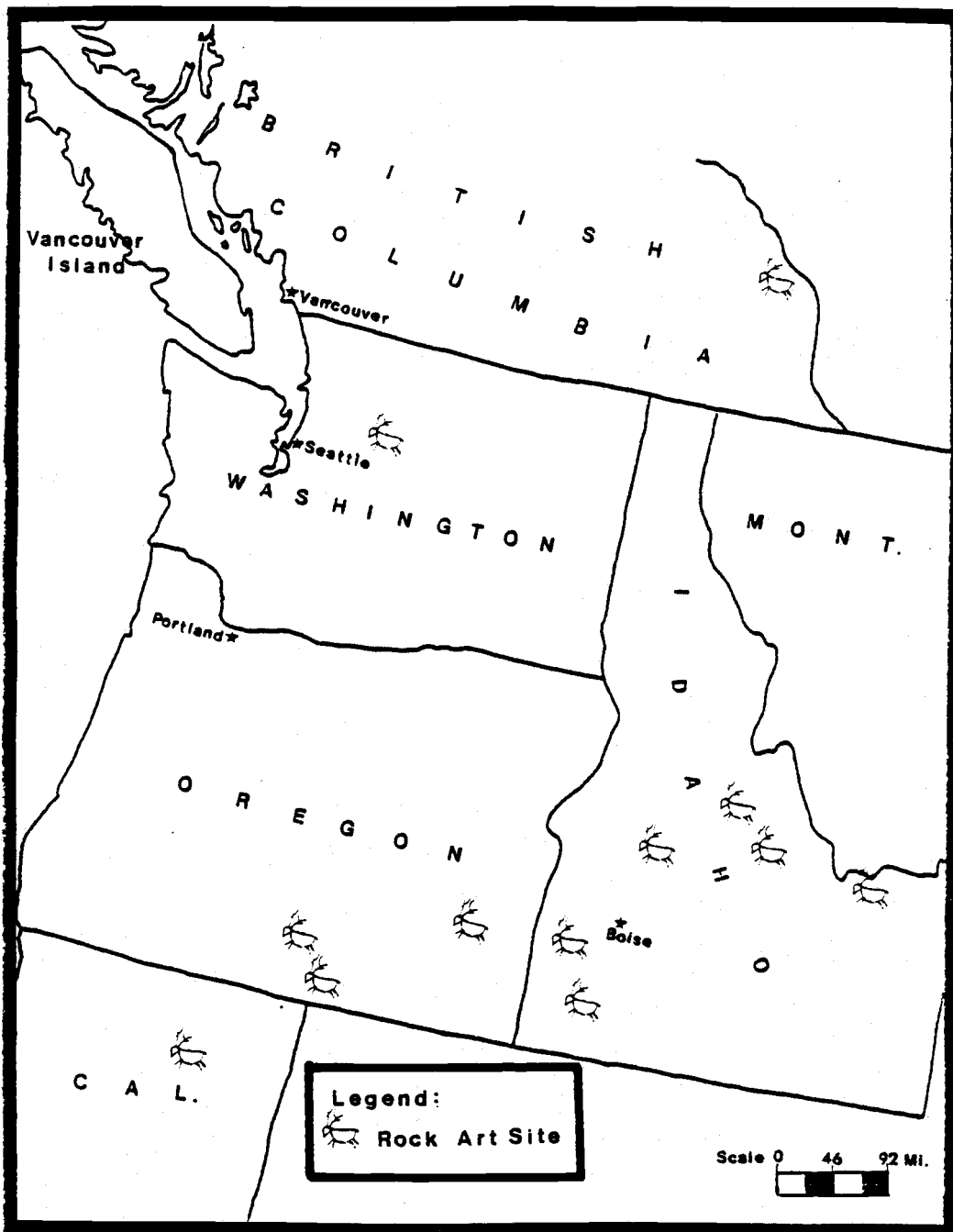


FIGURE 5

Distribution of Thermal Spring Rock Art Sites

and bison (Meagher 1973). The present sample size is too small to draw any inferences between rock art sites and thermal springs but it does point out a possible connection between these archaeological sites and their environmental settings. Additional research and recording of rock art sites in the Pacific Northwest need to be undertaken in the near future, since any interpretive value that might be gained from these sites is rapidly being destroyed by both human and natural forces.

Folktales and Legends

As with many things whose origin or make up is unknown to us, we tend to construct folktales and legends to help explain their existence. Often these stories are built around some moral aspect which is supposed to leave us with a lesson of the things to avoid or a manner in which we are to behave. The creation of these stories is a universal concept and can be found in mythologies throughout the world. These legends have been used to create mythical beasts that enabled the people to explain unknown phenomena (i.e., thunder, lightning or simply a rash of missing chickens) or be used as a disciplinary measure (coyote, sacred clowns) (Beck & Walters 1977). This same practice holds true for the existence of hot

springs. Legends have sprung up around many springs throughout the Northwest. It is not known what these legends might tell us of a past culture or way of life but they do serve to document the spiritual traditions of a people that might in time yield further insight into a culture's behavior.

Sol Duc and Olympic Hot Springs are located on Washington's Olympic Peninsula and were said to be created by the hot tears shed by two giant dragons which once fought for supremacy over the entire region. Both dragons were so evenly matched that eventually both admitted defeat and retreated to separate caves where they both still weep hot tears of mortification (Russell 1962). A similar battle between a fierce dragon and the Great Spirit created the healing waters of Hot Spring Arkansas as a reminder of the Great Spirit's power to create good. Battles against evil spirits appear to be a recurring theme in many of the hot spring legends with accounts being tied to the birth of springs in the Northwest. A hot spring legend involving Skookumchuck Hot Springs in British Columbia for example, was recorded by a Lillooet informant in 1970. According to the stories of his people, transformers came through the area and changed people to a rock or whatever their main characteristic was. They got as far as Skookumchuck,

where they found only two old people. The transformers told the old people that they were changing people into things that would benefit the people who were to come. The old couple thought about this and (Bouchard 1983:np):

...one of them decided to be hot water, boiling from the rocks, and the other one wanted to be cold water, near by where the people could bathe. When the people are sick, they can go and drink the hot water. Sickness, or any type of disease can be cured as long as there is hot and cold water.

The use of thermal springs as a beneficial or healing agent is quite obvious in the recorded legends. Features that played such a strong positive role in the physical environment of Native Americans was often represented in a similar light among folk traditions. This recurring theme tends to add additional support to the use of thermal springs as healing agents and health-giving resources.

Site Selection

Landscapes change in response to the interacting forces which operate upon them. The biological elements of landscapes are extremely sensitive to changes in water, temperature and the pressures of man and animals. An intensification or reduction of any of these

components could result in changes in the composition of native plant communities and the possible disappearance of certain species. Cultural responses to such changes may involve the reorientation of subsistence strategies, restructuring of land use patterns, or in extreme instances, major population displacement (Corson 1979).

Severe climatic changes have occurred throughout the Northwest during the past 10,000 years. These fluctuations have had a major impact on the available fauna and flora resources in any given area. The changes in available subsistence resources undoubtedly had a major effect on the settlement patterns of an area's prehistoric inhabitants. Thermal-heated areas maintained a very stable environment through time, with seasonal fluctuations in temperature and rainfall having little effect on their environment. A thermally-heated environment attracts a particular habitat consisting of distinctive plant and animal groups. Deep seated thermal springs exhibit complete constancy whereas most biotic communities are noted for various degrees of contingency. Thermal springs generally form a predictive environment, although limited in area, that can be relied upon even in periods of severe seasonal weather changes. A slight temperature drop may occur, but there will be no drastic change. Shallow seated thermal springs are fed in part by

ground water consisting of rainfall and water seepage which in extremely dry periods would suffer a diminished flow.

In attempting to reconstruct the subsistence patterns of an area's past inhabitants, an analysis of the flora and fauna available to them must be undertaken. In many instances biotic communities have changed drastically over the past century and present a picture probably not characteristic of any era in the past. The chief factors giving rise to their present state of deterioration are the severe overgrazing and fire suppression policies in force over most of the rangeland environments. The high degree of environmental change throughout the Northwest, and in particular the Great Basin, has made it extremely difficult to construct models of prehistoric land use with data on the distribution of plants and animals. Wildlife patterns have been altered from their natural range due to the redistribution of browse and forage and in response to pressures of increased human presence, with some prehistorically important species (i.e., big horn sheep) disappearing entirely from many areas.

Climax vegetative patterns need to be mapped in order to gain an understanding of the plant foods

available in any ecosystem prior to their historic decline. The structure and properties of an areas soil, topographic and climatic patterns need to be combined in order to form a basis on which native pre-grazing communities can be reconstructed. The U. S. Department of the Interior has been in the process of developing models of the distribution of climax vegetative communities under natural, non-grazing regimes. In time, these models should provide additional information for the reconstruction of prehistoric subsistence patterns. Until such patterns are effectively reconstructed, attention could be focused on areas known to attract hunting and gathering populations: since the existence of a reliable water source is essential to the location of most prehistoric sites, thermally -heated springs would have provided the most reliable year-round source of fresh water.

The criteria for site selection are often determined by local environmental elements and the period or season of its use. A site mesoenvironment consists of the topographic setting and landforms of an area utilized directly for subsistence. The microenvironment is based on the local physical and biotic parameters influencing the original site selection and effective during the period of site use (Butzer 1982). Hunters and gatherers

didn't necessarily spend their days where they spent their nights, and their subsistence was not confined to hearthside resources within the catchment area. With human environments, the essential components of the noncultural environment become distance, topography and biotic, mineral and atmospheric resources. Subsistence activities are normally limited by the distance from a site that can be walked in two hours. A two-hour perimeter (i.e., circle of 10 kilometers in diameter) is used to define the resource area of a prehistoric hunter-gatherer site (Vita-Finzi & Higgs 1970).

Schwede (1970) studied the relationship of aboriginal Nez Perce settlement patterns (Plateau) to the physical environment and the distribution of food resources. She found that winter villages were predominately located in the lowlands (between 500' and 1500' in elevation) where the temperatures were warmer, firewood, fish and game more readily available and often located at points along main travel routes (i.e., where trails crossed or important streams met). Seasonal campsites were based closely to resource availability. The camps were generally located in the uplands where accessibility to root fields and fish and hunting areas were readily available.

Steward (1938) described the settlement patterns of the Western Shoshoni (Northern Great Basin) as centering around independent families working as self-sufficient economic units that spent the majority of the year (spring-fall) foraging for plant foods with a minor emphasis on hunting and occasionally fishing. The winter villages were located in the mouths of canyons, in the pine nut-juniper belt in the mountains or in broad valleys near fishing streams. Steward (1938:232) states that:

...whether they were scattered at intervals of several hundred yards to a mile along streams, were situated at springs on mountain sides or were clustered in dense colonies depended on the quality of foods which could be gathered and stored within a convenient distance of each camp. In some places, families had to camp alone; elsewhere as many as 15-20 could congregate in a true village.

For the most part, specific locations of winter villages throughout the Pacific Northwest were determined by elevation and topography producing favorable climatic conditions (Nelson 1969, Caldwell 1954). The Cascades did not generally permit habitation during the winter months except on the western slopes. This rugged range of mountains could have been crossed at a number of passes during the summer and by two or three during the winter.

The chief use of this area by Native Americans was probably for hunting, fishing and berrying in season.

Extremely high altitude probably influenced seasonal patterns of resource procurement and site use. Altitudinal differences imply important climatological variability. Altitude determines the onset of the seasons, the rates of plant maturation, snowfall and snowmelt and it influences the scheduled animal migrations. Since both plant growth and animal movement are coordinated by altitudinally controlled cycles, high elevation thermal springs are expected to have played an important part in the selection of prehistoric habitation sites (Samuelson 1981). Thermal springs located in extremely high elevations would not be desirable locations for prehistoric hunting locale. Most game animals would have migrated to the lower elevations before the onset of winter and the available forage resources could only support a small number of large game animals. Winter occupations near these sites could have been planned for a small group or family or they might have been utilized by people trapped by an early snowfall, migrating to the springs for survival.

Thermal springs located in the lower elevations would have served as ideal wintering locales (Butzer

1982). Since the hot spring water and runoff was warm enough to remain ice free throughout the year. Where the springs occurred near the channel of a river, the warm stream would provide an ice free location for waterfowl to alight (Howe 1968) and for fish to remain all winter (Spier 1930), even during the most severe winters when lakes and streams elsewhere were frozen. Large game would be attracted to the springs as a natural source of fresh water and salt. One of the more obvious and useful aspects of wintering near a hot spring would be the constant availability of hot water to facilitate bathing, cleaning and utilitarian activities plus the use of the waters for their supposed healing qualities. Historic and archaeological information notes the use of many hot springs for winter occupation sites (Figure 6). Table 4 (p. 206) documents the tribal affiliation and ethnographic reference for each of these village sites.

Thermal areas would have also attracted native populations during other seasons of the year. There would be a marked decrease in use of the springs linked with subsistence activities, but the medicinal and utilitarian uses would remain constant. Large game animals are especially attracted to thermal areas only during the winter (Samuelson 1981). In the hotter months, the heated water would have little effect on attracting fish or

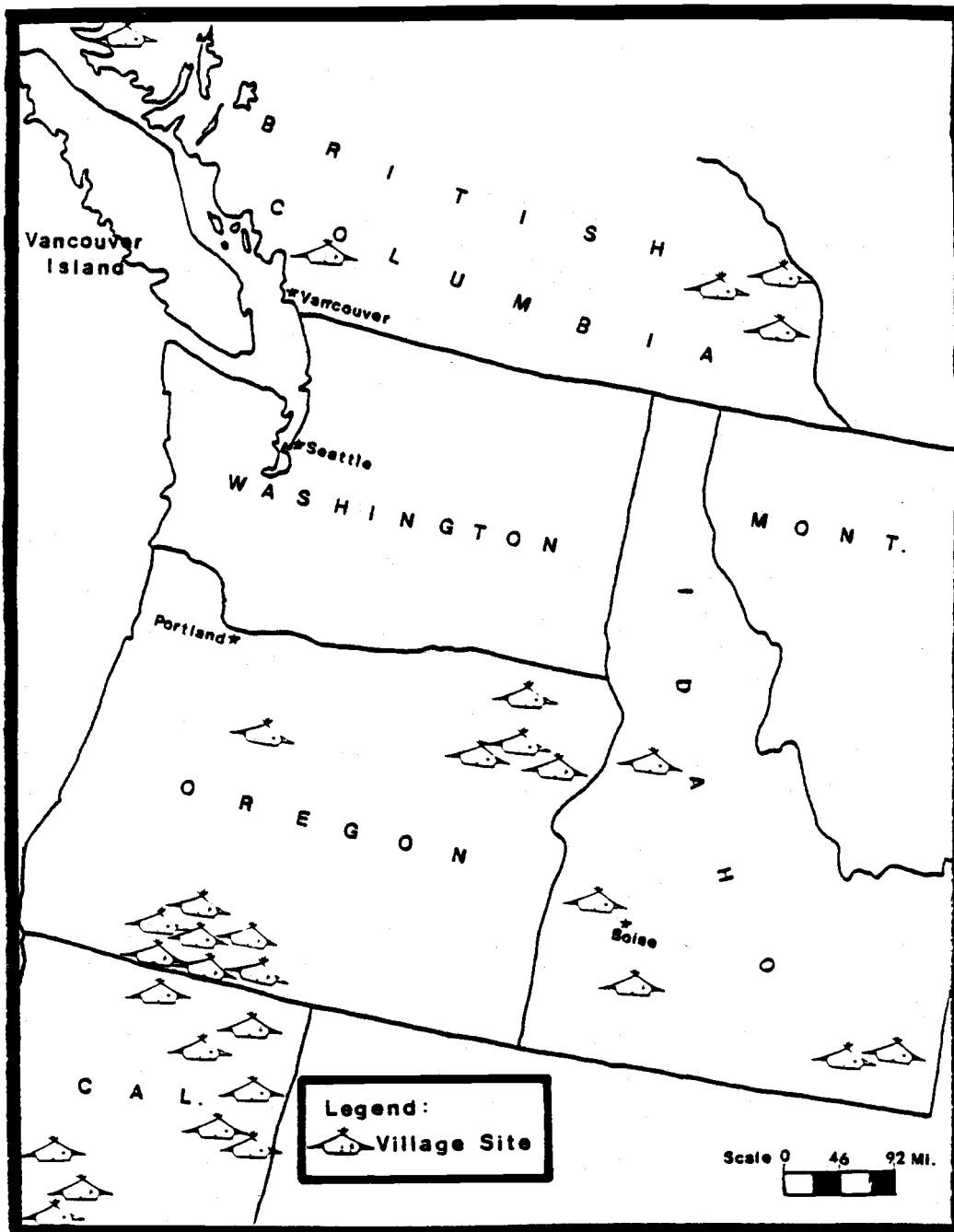


FIGURE 6

Location of Ethnographically Documented
Thermal Spring Village Sites

fowl. The subsistence activities of the Plateau inhabitants centered primarily around the acquisition of fish, plant gathering and hunting, probably in that order of importance. Seasonal camps would focus on areas yielding the most abundant and variable subsistence resources within the smallest locale. Plant resources were reasonably abundant, dependable and predictable to the Plateau region's physiography and rainfall (Rice 1970). The existence of a hot spring would but add one more factor to be considered in the site selection process. Great Basin subsistence resources focused primarily on plant procurement and hunting. Due to yearly and local variability, food resources and the subsequent food procurement circuit were often unpredictable. The seasonal round focused on those areas where seed products and pinion nuts were more readily available. Any existing thermal spring would most likely be incorporated within the round only when it coincided with the food quest.

Summary

A survey of ethnographic information revealed a wide variety of uses employing thermal spring waters by the native inhabitants of the various Northwest regions. These uses ranged from taking advantage of the attraction

of large game animals to the salt producing waters to supplement their native diet, to the use of the waters as a physical and spiritual therapeutic aid; from making use of the water's properties to aid in the preparation of food, basketry or hides to the use of the springs soil as a face paint or soap. The waters seem to have been adopted to almost every aspect of the Native's lifeways. This versatility in employing the hot spring environment centers around the adaptability of most Native American groups to their surroundings in employing an area's resources to the methods most advantageous to them.

In attempting to extrapolate the usefulness of this information in predicting the use and importance of thermal waters to prehistoric people through time and across cultural regions, three major problems arise. The first and most basic problem that must be dealt with is the validity of the collected ethnographic information. Most of the available information on past native hot spring use has been derived from the journals of early trappers, explorers and settlers and from the descendents of the original Euroamerican spring owners. These individuals lacked professional training in the accurate recording of observed Native lifeways and their recording represents the biased interpretation by a non-native culture. The recorded acts observed by these early

Euroamericans are probably fairly accurate (i.e., preparation of basketry, hides, soap) but any interpretation applied to these acts must be questioned. An example would be the assigning of particular spiritual or physical attributes that are anticipated by use of the spring's water (i.e., taken internally to relieve kidney ailments or the praying for a particular kind of power or luck). Those few accounts recorded by Native informants would reveal the most accurate information but even then they would only be pertinent to the use of a spring's water by their specific group.

The second problem arises when one attempts to infer that the observed hot spring practices at the time of historic contact can be used to explain the possible uses of hot spring water 1,000, 5,000 or 10,000 years ago. Archaeologists can not infer the cultural affiliation of an area's inhabitants over any extended period of time so that specific uses of an area's environment certainly cannot be determined. The natural appeal of thermal springs such as the attraction of large game, and their use as year round water source would remain constant through time but the cultural uses (task specific) could not be projected.

The third major problem stems from the scarcity of available ethnographic accounts detailing the Native uses of hot springs. With the advent of Euroamerican settlers into the Northwest, Native Americans were quickly rounded up and placed on reservations and often forbidden to use the hot springs located within their area. The use of this environmental feature was not thought very important by most early ethnographers and explorers so that if any information was recorded it was just to state that the Indians were observed "using" the local hot springs. While the study does reveal a number of uses of thermal spring waters employed by Native Americans, the sample is generally too small to infer a particular use in any region or area. The only use of thermal springs that appears to be consistent throughout the Pacific Northwest is the external use of the spring's water for bathing and its application as a medicinal treatment such as sore muscles, rheumatism, and skin problems (see Figure 4). Whether the use of these springs were all medicinally-oriented or merely used as a hot water bathing locales and misinterpreted by the early recorders cannot now be determined.

V. ARCHAEOLOGICAL SURVEY

An examination was made of all available sources to ascertain the number and location of any archaeological sites that had been recorded within close proximity to a thermal spring in the Pacific Northwest Region. These sources included: state historic preservation offices, national forest services, the Bureau of Land Management, the British Columbia resource management division, museums, archival centers and various regional archaeologists. It was predetermined that only sites located within a 1/4 mile radius of a thermal spring would be examined. Since site selection for those locations further than a 1/4 mile radius might have been influenced by the presence of a thermal spring, but their association would be much more tenuous.

An examination of the recorded archaeological sites revealed a strong bias in their identification process. The majority of the recorded sites found near thermal springs were located on land currently managed by the federal government and had been identified during cultural resource surveys that had been oriented around proposed projects (timber sales, prescribed burns, land exchanges). This sampling bias omits those sites located

in inaccessible or undesirable locations and those that were privately owned.

The movement to settle the northwest occurred during the last half of the nineteenth century which coincided with the popularity of thermal waters and the belief that the naturally heated-waters provided a cureall for most diseases and complaints. This belief sparked a strong interest in property possessing thermal phenomena and most accessible parcels of land possessing thermal springs were claimed under the early homestead laws. To help balance out the absence of information from privately-owned springs, several of these springs owners were contacted to ascertain if any archaeological material had been recovered in the spring's vicinity.

The total number of natural thermal springs located within the project area was found to be 457 (Berry et.al.1980; McDonald 1980). A total of 81 thermal springs were found to have one or more archaeological sites located within close proximity, which reveals that 18% of the springs had known archaeological sites. (Table 5 on pp.207-209 lists site specific information for each of these spring sites). With additional survey work and communication with area spring owners, the percentage of sites at springs would undoubtedly increase dramatically.

Very little information has been recorded on the prehistoric use of thermal springs. In order to see if remaining cultural material might reveal information pertaining to past spring use, a sample survey of the previously-recorded springs was decided upon. These sites also would be surveyed in hopes of determining the possible site type (village, hunting camp), time range of occupation (C14 dating or projectile point cross dating), and seasonality of use. Of the 81 recorded spring sites, five have had major excavations or testing operations occur at the sites in the past. All five excavated/tested sites were selected since they would have had the highest potential of yielding any possible information.

In order to obtain a representative sample of the remaining 76 springs with known archaeological sites, they were divided into twelve stratigraphic units based on environmental criteria. Major drainage areas and mountain ranges were chosen as the prime criteria for unit selection due to their having a possible influence on the settlement and subsistence patterns of a given area's inhabitants. For the Northwest Coast Region the unit placement criteria were determined by the spring's location in regards to the Frazer and Columbia Rivers located west of the Cascade Mountains. The Plateau Region

was divided into seven units centering around the Salmon River, the Boise/Payette River Drainages, and the Lochsa, Columbia, Kootenay, Snake and John Day Rivers. The Northern Great Basin comprised two units centering around northeastern California and the Lower Snake River Drainage. The largest percentage of the selected units were located within the Plateau due to it comprising the largest portion of the study area and also containing the highest number of hot springs. Approximately thirty-two percent of the springs from each unit were selected using a stratified random sample without replacement. Using this sample technique, twenty-one spring sites were selected, combined with the five previously excavated/tested sites yielding twenty-six sites to be surveyed (Figure 7). Historical and archaeological information for each of these sites was collected in hopes of determining possible regional variations in site use. Each spring was visited to check on the present status of the spring and its associated site and to determine if additional archaeological material could be located. The following information was obtained concerning each of the twenty six selected sites.

1. Spring Name..Kelly Hot Springs Site No#CA-MOD1795

Elevation .. 4363'

Temperature .198°F

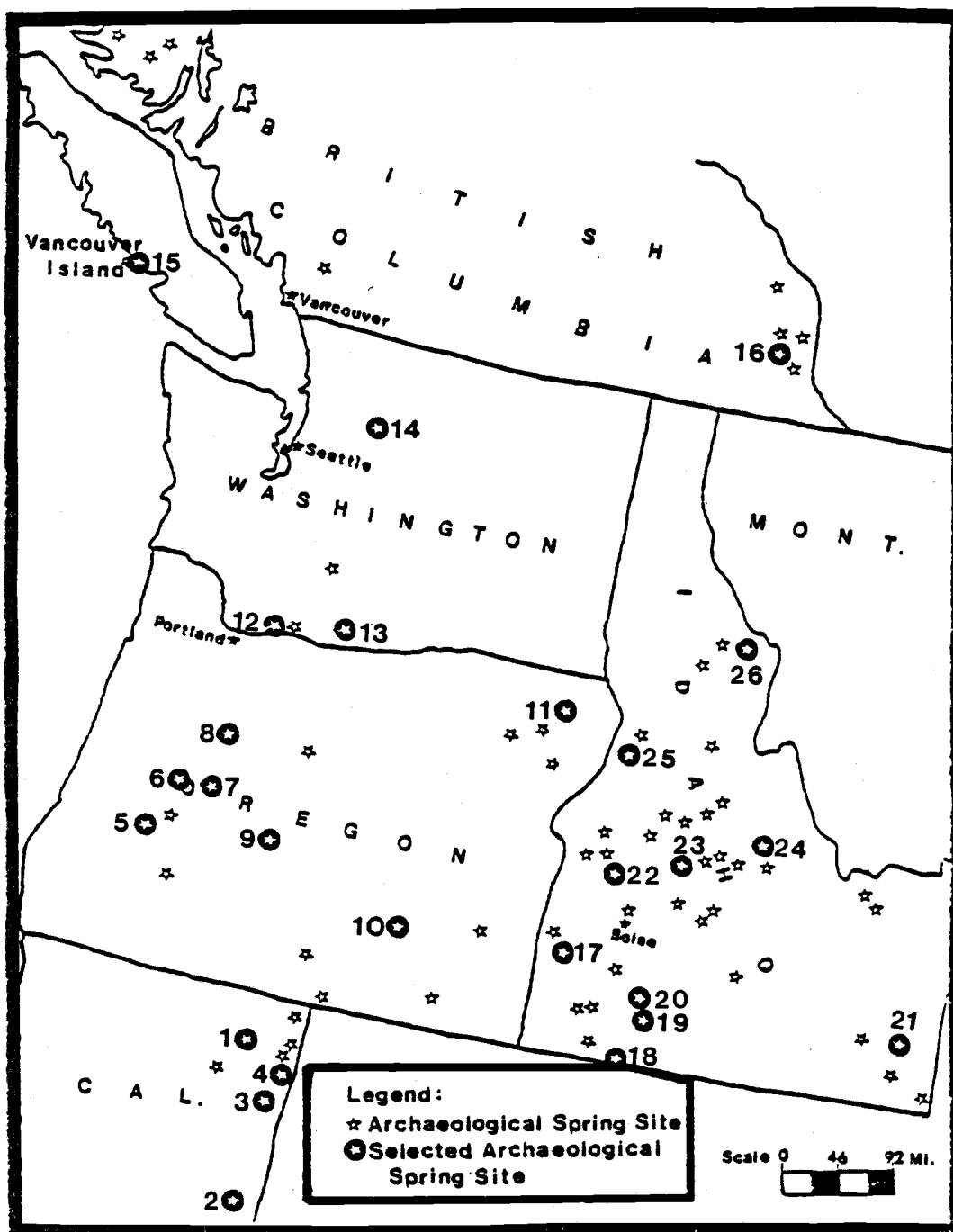


FIGURE 7

Distribution of Archaeological Thermal Spring Sites

Ethnographic Data: Kelly Hot Springs is located in the traditional territory of the eastern Pit River Native American group known as the "Astariwawi" or "Canby people". Village (permanent winter settlement) site selection within the Pit River territory relied upon the availability of a spring or stream and ready access to wood for fire. In precontact times, the Astariwawi consisted of a collection of four subgroups, each with its own leader. By historic times, they had adopted a central leader, whose office was held patrilineally, and who resided at Astariwa, a village in the immediate vicinity of the hot springs (cf. ?asta'q^h 'hot') at Kelly Hot Springs.

A review of the ethnographic and historical use of Kelly Hot Springs (Silver & Hunt 1980) was completed under contract in conjunction with a proposed 150 acre swine raising and feed production agricultural complex to be built near the hot springs. Interviews were conducted with five Native Americans and six non-Indian residents as well as the use of ethnographic and linguistic material in the process of compiling this survey. All of the consultants agreed that the Indian use of Kelly Hot Springs had been significant until approximately thirty years ago when the area was closed to the public.

All of the Native American consultants agreed that the Kelly Hot Springs was known and used by Indians for therapeutic benefits derived by the hot mineral waters. Ruby Miles (Astariwawi) stated that the Indians didn't destroy anything "except what was used for medicinal purposes: just below the hot springs where the water is too hot, Indian people get into the creek and cover themselves up with the sand" (Silver & Hunt 1980:20). Indians from Hewisedawi, Qosalektawi and Hammawi Territories, all territories occupied by the Pit River Indians, used to come to the hot springs for therapeutic purposes. Erin Forrest (Hewisedawi) spoke of individual rituals that were associated with bathing in the warm water that flowed out of the spring to the south. Jean Peade (Hammawi) remarked that the spring was "mostly a place to go to ask for good health"; and Della Wright Baker (Astariwawi) said that she knew "nothing about the place except that when you go there you got to think good". None of the informants knew of any past or present use of the spring in regards to seeking "power". Ruby Miles compared it with a hot spring near Adin where a Native doctor use to admit to seeing a very pretty woman come out of the spring and sit around on the bank. Two other springs east of Adin were used by the old timers "to stop overnight and go early in the morning to get power", one of the springs being a power place for

gambling. Kelly Hot Springs was described by one informant as a powerful spot, although not one used for power quests. The power associated with the spring was to be avoided (Silver & Hunt 1980:14).

The Astariwa were known to practice both cremation (Olmsted & Stewart 1978:232) and burial (Voegelin 1942:136,230) as a means of disposing of their dead. John Kelly, grandson of John Kelly who owned Kelly Hot Springs from 1897 to 1910, recalled that his father and grandfather knew of an instance of a winter burial near Kelly Hot Springs.

An Indian man died and his family, or friends, laid the corpse out on the ground until it froze; they then took it down by the channel of water flowing from the hot spring and pushed it into the mud and covered it with rocks (Silver & Hunt 1980:16).

A similar type of burial was uncovered near Hot Creek to the northwest when a local resident, while digging out a spring near his house, discovered a skeleton that had been covered by a pile of rocks and mud. Erosional exposure of burials such as these might account for Heizer's (Heizer & Treganza 1944) belief, reported earlier, that hot springs were used extensively as a means for burial of the dead. Several Indian cemeteries were known to be located in the vicinity of Kelly Hot Springs and some are still in use today.

The hot springs at Kelly Hot Springs were also used for specific non-therapeutic use such as preparing tules for use in basketry designs. The hot spring water facilitated not only the cleaning of tules but it also darkened the tules to a suitable color for use in designs. Members of the Astariwawi, Hammawi and Qosalektawi Territories brought tules and willow materials to the hot springs to prepare them for use in basketmaking.

They had the convenience-like warm water and hot water-right there...; they not only prepared tules but soaked fine willows so that they could be bent around easily and some could be put away and used a little bit later (Silver & Hunt 1980:10).

The Hammawi packed tules and willows to Kelly Hot Springs because there were too many rattlesnakes around the hot springs in their territory (Silver and Hunt 1980).

Erin Forrest, director of the Modoc Indian Health Project, has stressed several important physical and mental concerns regarding the Indian use of the hot springs. He states that there are many arthritic cases among the elderly Indians that could be helped by use of the medicinal waters and there are rituals associated with the therapeutic bathing (i.e., people singing certain songs while bathing). He believes that the use of the area by the elderly would stimulate younger Indians

to be interested in their identity and would contribute to the restoration of a sense of Indian ethnicity (Silver & Hunt 1980:22).

Archaeological Information: Two archaeological sites were identified during the 1980 survey of the Kelly Hot Springs area (Hughes 1980), the Kelly Hot Springs site (CA-MOD-1795) and the Mohr site (CA-MOD-419). The Kelly Hot Springs site measures over 1,150m. X 300m., is located around the hot springs and adjacent reservoir area and is believed to be the location of the ethnographic Astariwawi village of Astariwa. The Kelly Hot Springs site is an extremely large site with a potential depth of over 1 meter. A surface survey of the site revealed over 400 ground stone fragments (mortars, milling stones, pestles, hand stones, shaft straighteners and hopper mortar bases), a variety of projectile point fragments and lithic debitage. The age of the site based on estimates derived from cross-dating time sensitive projectile point types, appears to date back as early as 9000 years and was used at least on an intermittent basis during the ethnographic times. The upper 20-30 cm. of deposit has been disturbed by past plowing activities but the site appears to have retained much of its integrity (Hughes 1980). It has a very high potential of

contributing important information on the areas prehistory.

The Mohr site is located approximately 800 meters west of the Kelly Hot Springs and is about 140 m. long X 370 m. wide. It consists of a sparse lithic scatter (3-5 flakes per 1 meter sq.) with two mortar rim fragments, a milling stone, a possible hopper mortar base and an obsidian scraper. This area has undergone intensive farming activities for years. No time sensitive projectile points were observed that might possibly suggest an age to this site, nor was there any indication of the site's depth.

Present Status: Kelly Hot Springs was visited during August 1984 to review the current status of the previously-identified archaeological sites. No sign of a swine raising and feed production agricultural complex could be seen. The Mohr site is located in a field currently under cultivation with no sign of any additional disturbance. The Kelly Hot Springs site has had a unimproved road and two greenhouses built adjacent to the hot springs. The owner of the property was unable to be found and the presence of two guard dogs eliminated the opportunity for any on site inspection of the site

itself. Disturbances of any subsurface deposits appear to be minimal

The Kelly Hot Springs resource area is owned by the Geothermal Floral Company. They are currently in the process of evaluating the spring site for the installation of four binary generating units to generate power (Karlsson 1984). It is uncertain if this plan will be approved in the near future or if the construction will cause any impact to the archaeological resources that have been identified.

2. Spring Name... Wendel Hot Springs Site No.# LAS-28

Elevation...4010'

Temperature.206⁰F

Ethnographic Data: A large winter village, Pam^u, was located around Wendel Hot Springs and used by the Honey Lake Paiute. Obsidian from this site was later thought to have been collected and used by the Wad'atkuht Paiute at their Pag'ushuhad winter village located at a warm springs in the vicinity (Riddell 1960).

Archaeological Information: A habitation site was located on the salt grass flats surrounding Wendel Hot Springs in December 1948 by F.A. Riddell. He estimated the site covered a 200'X 130' area with recovered artifacts including: manos, projectile points, scrapers, a small clam shell disc head and a drill. No information could be located on the number or variety of artifacts recovered or if they were collected or left in situ. The possibility of destruction for the site was thought not probable.

Present Status: The Wendel Hot Springs site was visited in August 1984 in an attempt to reexamine the archaeological potential of the area. Wendel Hot Springs and its surrounding environs is presently owned by GeoProducts Incorporated and is used for their Honey Lake Farms Project. Over thirty (124' X 30') units of a planned 205 geothermally-heated hydroponic greenhouses are now built around the springs and are producing European cucumbers and tropical tomatoes (Boren & Johnson 1978). Cement foundations for several new greenhouses are located just to the north of the hot springs. Permission could not be obtained to survey the area thought to contain site LAS-28. Riddell did not believe that the site had much depth. If this were true, the site has been

fairly well destroyed by highway construction and the installation of the complex of greenhouses. Construction at the site has been totally funded through private sources. No environmental documents (EIR's, EA's, EIS's) have been completed by the developers. The county's only concern has been with water quality and so far this has not been a problem (Deller 1984).

3. Hot Spring Name...Menlo Baths Site No.# CA-MOD-197

Elevation... 4250'

Temperature... 135⁰F

Ethnographic Data: No prehistoric site information was identified for the Menlo Baths hot spring area. The Surprise Valley band of the Northern Paiute (the ground hog eaters or Gidutikadu) were known to occupy extensive areas east of the Warner Range including the Menlo Baths area (Kelly 1932). In the early 1920's, both thermal springs located at this site were dammed to help create swimming pools. A number of structures including bathhouses, a beer hall, several sheds and chicken coops were built along the terrace edge. The property was abandoned in the late 1930's with all remaining structures in an advanced state of decay.

Archaeological Information: The Menlo Baths site was first recorded in 1966 and tested during the summer of 1967. The site centered on two small hot springs which provided a year-round flow of warm water which drained out onto the low ground forming a small marsh. The site itself was found to cover an area of over twelve acres with midden deposits measuring 5'-6' in thickness.

Damage to the site as a result of past construction and farming activities was quite severe. Fill for the dams was obtained from the midden deposits with up to 6' of deposits being removed from some locations.

Six five-foot-square test units were excavated to a depth of 54". The sample size was very small considering the overall site dimensions but O'Connell's (1971) main objective in testing the site was an attempt to develop an artifact sequence for the Surprise Valley area. O'Connell suggests that a site as large as Menlo Baths was never occupied over its entire area at any one point in time. He believes that the center of occupation was relatively small and tended to shift in location over the site throughout its history. Such shifts inevitably resulted in the distribution of refuse that, given the sample size, could not assume to represent the full span

of occupation or the full range of activities characteristic of the site as a whole.

The recovered artifact assemblage included metates, mortars, pestles, ground stone and over 390 projectile points. The projectile points by far constituted the most common artifact category recovered. Because of their frequency and established sensitivity as time markers, they served as a primary factor in establishing stratigraphic relationships at Menlo Baths. The recovered projectile points were classified into numerous categories including: Northern side-notched, Elko Series, Bare Creek Series, Humboldt Concave Base B, Eastgate, Cascade and Cottonwood. These projectile point types were found to be associated with three basic phases or sequences of occupation in the Surprise Valley which encompassed the past 7000 years.

O'Connell's study of the Surprise Valley identified eight major biotic communities, each having a definitive set of topographic and biotic characteristics which would distinguish it from other communities. The composition and subsistence resource potential of each community varied seasonally with some able to be profitably exploited during particular seasons while others offered potential resources the year round. The study concluded that food and water resources were at a minimum during

the winter months. O'Connell combined all of the ethnographic data with the available information on the site's artifact assemblage and its environment in the form of a model of prehistoric settlement subsistence in the Surprise Valley. In the winter, settlements were at large lowland occupation sites and the subsistence was based on stored foods and the hunting of available game. He suggests that the Menlo Baths site represents such a winter occupation site (O'Connell 1971).

Present Status: The Menlo Baths resort property was purchased in 1969 by the present owner. He had no knowledge of the existence of any archaeological site or past excavation that had taken place on the land. Wanting to upgrade the property's present condition, he brought in bulldozers to level the remaining structures and to landscape his property. A large swimming pool, lake and sauna were built with an underground system of drainage pipes to divert the spring's runoff. During the course of the construction, a large box of "arrowheads" and over a dozen stone bowls, metates and pestles were recovered. One stone bowl found in the backyard measures over three foot in diameter at the top.

With the massive construction and landscaping completed by the current owner of Menlo Baths, combined

with the past destruction to the site by the previous resorts construction, very little site potential is thought to remain. It is possible that portions of the property farthest away from the springs and residence might still be in a fair state of preservation.

4. Spring Name...King's Dog Spring Site No.# CA-MOD-204

Elevation...4500'

Temperature...208⁰F

Ethnographic Data: No prehistoric site specific information was identified for the King's Dog site area although this area was known to have been utilized by the Surprise Valley band of the Northern Paiute (Kelly 1932).

Archaeological Information: The large playa east of Cedarville is characterized by a series of large hot springs located along the dune surface. Runoff from these springs has collected in the low areas forming extensive marshes varying in size from a few acres to several square miles. This mosaic of marsh and dune areas provided a wide range of subsistence resources which helps to account for the large aboriginal occupation

sites with midden deposits found in the vicinity of each of the larger springs. The King's Dog site is one such site that lies on a stabilized dune adjacent to a large hot spring. The runoff from this and other area springs form a large marsh that covers a one square mile area. The site itself extends over a 400' X 300' area with a midden deposit having a maximum depth of approximately 8 feet. The site was initially surveyed in 1967 with excavation taking place during the following two summers. Thirteen house depressions containing a total of twenty house floors or occupation surfaces were uncovered in the midden deposit. An additional site (CA-MOD-203) is located just south of the large hot spring and on the surface appears very similar to the King's Dog site.

Livestock grazing during the late 1800's caused severe reduction in the vegetative cover which allowed the dune to become more susceptible to wind erosion and deflation. The effects of this deflation are not known but it could have resulted in as much as a 30% decrease in midden area. Additional disturbance to the site area occurred with the construction of a salt works near the hot spring. A building and system of ditches, dikes and evaporation pans near the marsh area probably caused only minimal damage to the midden deposits but the activity resulted in an increase of vehicular traffic which encouraged erosion in some areas.

Two field seasons were spent in excavating the King's Dog site. The initial testing had exposed a series of deeply buried house floors so that future excavations were directed toward their exposure and the establishment of a sequence of occupation at the site. Cultural features at the King's Dog site were more common than at Menlo Baths and included the remains of structures, hearths, ash lenses and pits (O'Connell 1971). The recovered artifact assemblage included metates, mortars, pestles, pieces of ground stone and a wide range of projectile points with over 1200 whole and fragmented points being identified. These projectile points were classified into several morphological categories including; Northern side-notched, Humboldt Concave base A, Rose Spring, Eastgate, Alkali Stemmed, Elko Series, Bare Creek Series and Cascade. The point styles were found in association with four sequences of occupation in the Surprise Valley which encompassed the past 7000 years. O'Connell (1971) suggests that the King's Dog site, like Menlo Baths, served as a lowland winter occupation site for the Surprise Valley Paiute.

Present Status: Sites CA-MOD-204 and 203 are located approximately 1/4 mile from the Surprise Valley Mineral Wells Motel. A house, remaining from the abandoned salt

works, is collapsed at the north end of a hot spring near the archaeological sites. Obsidian flakes were seen scattered over a 130 meter X 100 meter area at site #204 with several pestle, metate and ground stone fragments visible at site #203. A pond measuring over 100 meters in diameter is located just north of the hot springs and is fed by the hot spring runoff. No sign of the past excavation or any recent disturbance were in evidence.

5. Spring Name... Kitson Hot Spring Site No#...35LA26

Elevation... 1600'

Temperature...109⁰F

Ethnographic Data: Kitson Hot Springs was first homesteaded in 1865 by Dave Kitson after being shown the area by Charles Tufti, a Molalla Indian. The area soon developed into a major resort for the Willamette Valley. Indians continued to come to the springs well into the 20th century and used the springs for healing purposes (Hills 1982) and the curing of salmon (Horowitz 1973). Hills recalls the Indians on horseback arriving at the springs throughout the summer to make use of the heated waters. He noted that the majority of Indians who

frequented the area preferred to use McCredie Hot Springs which were located approximately 5 miles east. He did not know why they preferred McCredie over Kitson but they told him that they considered McCredie to have more health giving properties. McCredie Hot Springs has a temperature of 163⁰F, considerably higher than that of Kitson Hot Springs.

Archaeological Information: A small (18m.X 10m.) lithic scatter was located on a terrace along the right bank of Hills Creek, 1/4 mile south of the hot springs. The site was comprised of 30-40 obsidian and cryptocrystalline flakes (most flakes being very small and suggesting sharpening or retouching activities) and a number of tools. Tools recovered included two foliate bifaces and a corner notched or side-notched projectile point. The site has suffered some disturbance in the past due to yarding activities. Additional points have been collected by the past caretaker and the Boy Scouts of America (the current spring owners) but this material has since disappeared.

Present Status: The spring area was resurveyed in March 1984 in an effort to identify any additional

archaeological sites and to reevaluate the previously known site. The area surrounding the hot springs has been severely disturbed (bulldozed & burned) by the construction and development of the Kitson Springs Resort. No archaeological material could be found anywhere in this area. The lithic scatter previously recorded was resurveyed but, due to the thick low ground cover, visibility was very poor. A small number of obsidian and ccs flakes were observed. Previous disturbance by logging and heavy equipment is in evidence throughout the area. CCS nodules, flakes and two unifacially worked flakes were found in a road cut 200 meters north of the site.

6. Spring Name... Foley Hot Springs Site No.#... none

Elevation...1760'

Temperature.176⁰F

Ethnographic Data: Foley Hot Springs was first discovered in 1865 and purchased in 1870 by Abram Foley. It thrived as a popular Oregon spa from 1874 to 1930 and was advertised as being effective against rheumatism, catarrh, dyspepsia, liver and kidney complaints. An old

Indian trail was known to have followed Avenue Creek from Foley Ridge to the hot springs, which was rumored to be called "stinking waters". Indians from the Warm Springs Reservation continued to visit the springs long after the turn of the century.

Archaeological Information: Numerous archaeological sites have been identified in the general vicinity of Foley Hot Springs on National Forest Service land. The land surrounding the hot springs was never surveyed due to its having been privately owned from such an early period. Two open campsites, a peeled cedar tree (basketry?) site and a rock feature were all identified within a 1/2 mile radius of the springs.

Present Status: Permission was granted to survey the Foley Hot Springs area in August 1984 by William Runey, the present owner of the springs. The springs have been in the Runey family since 1880. One scarred cedar tree was found 1/8 mile above the hot springs next to Avenue Creek. This scar measured 1 meter X 40cm.. Mr. Runey remembered a large plot of scarred cedar trees behind Foley Springs on Forest Service land but these had all

been harvested by 1965-1966. Additional scarred trees can be found on both sides of Avenue Creek along a trail that leads up to Foley Ridge. The ridge has long been known as an excellent location to gather huckleberries which in season are quite prolific. Runey recalled the discovery of many projectile points near the springs hotel but most were collected by hotel residents and have long since disappeared. These projectile points were all long (1 1/2"-2") leaf-shaped points (Cascade-like) with one desert side-notched-like point also being found.

Two additional archaeological sites near the spring area also have been mentioned. A large lithic reduction site was said to be located near the entrance to Foley Springs. Runey recalls seeing piles of obsidian flakes and tools in this area which has now been destroyed by road construction. A small cold mineral spring, located in a cave up behind the hot springs, has been the site of the recovery of several projectile points. The animals in the area have dug out this spring. All of the archaeological material recovered by the Runey family was kept in the hotel near the spring site. The hotel was gutted by fire in March of 1981 and none of this material was ever recovered.

William Runey recalled Indians from the Warm Springs Reservation coming to the springs when he was very young. They would build sweat lodges over the spring waters near its source. They would damn up the springs to form small ponds and build small lodges over them to sweat. Below the present swimming pool, the hot water used to flow into a large muddy area. The Indians would put their horses in the mud to heal their sore feet or would pack the hot mud on their backs to heal any sores (Runey 1984). Whether they used this mud on themselves in a similar manner is unknown but thought likely.

7. Spring Name...Belknap Hot Springs Site No#...35LA459

Elevation... 1760'

Temperature.190⁰F

Ethnographic Data: No site specific data was located dealing with the prehistoric use or occupancy of the Belknap Hot Spring locale although the area was known to have been utilized by members of the Molalla (Rigsby nd).

Archaeological Information: An aboriginal site consisting of several scarred cedar trees and a variety of lithic debitage was found directly downstream from the source of Belknap Hot Springs. The hot spring issues out of a hillside and cascades over the rock strewn bank for about 20 feet before merging with the McKenzie River. If the hot spring water was ever used by the native inhabitants, they would have had to construct stone pools by the river's edge to entrap the water. These pools would have been destroyed each spring due to seasonal flooding. Belknap Hot Springs is located on the north side of the McKenzie River with the current Belknap Springs Resort built on the south bank of the river directly across from the spring's source. Prehistoric cultural material was located on both sides of the river but the largest concentration was found near where the resort is now located.

An abundance of cultural material was found during the construction of the resort and the residence of Randy Smith, who owns the property where the hot spring source is located. The resort was first built around 1865 and has attracted large numbers of tourists ever since. Additions have been built on to the resort during various times in the past and it was during these stages of construction that most of the artifacts, currently owned

by Mr. Smith, were obtained. The tools recovered include numerous obsidian unifaces, drills, scrapers, utilized flakes, bifaces, knives and over a dozen projectile points. Numerous obsidian flakes and small tools can still be seen eroding out from the terrace and road berms. Projectile points found at the site include Desert side-notched, Elko-eared and Cascade-like points, which suggests that this site was used at least intermittently over the last 8,000 years (Heizer & Hester 1978, Leonhardy & Rice 1970). Only two projectile points were recovered on the north side of the river near the spring source and both of these resemble variations of Desert side-notched points which would reflect a relatively late period of occupation.

A stand of mature red cedar trees are located 100 meters west of the spring source and a few of them exhibit scarred trunks where a rectangular (56cm. X 41cm.) piece of bark (wood) had been removed. This entire piece of bark and/or wood might have been removed to be utilized in the construction of a bent-wood carrying/storage box. A local resident, Manina Sparks Schwering, has a bent wood box constructed of cedar bark that would have required a slab of bark similar to the ones removed here. It is not known if the thermal waters would have been used to assist in making the bark more pliable for construction but the importance of heated

water has been previously noted in the construction of this type of box (Goddard 1924, Boaz 1908).

Indians from the Warm Spring Reservation often visited the springs around the turn of the century. They would cross the Cascades with their wagons, using the McKenzie Pass, and would camp by the springs to catch and dry fish (trout) and to use the springs (Randy Smith, personal communication). Disturbance to the site excluding areas where buildings have been constructed appears to be moderate and the potential for remaining site integrity is fair.

Present Status: Minor construction activities and campground maintenance is an ongoing process in order to keep the resort attractive to the area clientele. Damage to the buried cultural deposits increase every year due to construction, erosion and collecting activities of the campers. Cultural material on the north side of the river was never very abundant but no additional subsurface disturbances are planned for the near future.

8. Spring Name..Breitenbush Hot Springs Site No#.35MA51

Elevation...2240'

Temperature.. 198⁰F

Ethnographic Data... After the formation of the Indian reservations, Indians from the Warm Springs Reservation were said to have visited the Breitenbush Springs area regularly. They crossed over from the eastern side of the Cascades along the Lemati and old Rapadan trail and often camped near the springs during the summer and fished for salmon near the confluence of the Breitenbush and North Santiam Rivers. The men dug out pools in the rocks for use as bathing areas while the women apparently spent at least part of the season on the slopes of Mansfield Ridge (Squaw Mountain) (Horowitz 1973). Area informants indicated knowledge of the Indians using the hot springs as a mud bath for therapeutic reasons in the 1930's (Regula 1982). During a small pox epidemic in the early 1900's, the Indians packed mud on the lesions in an attempt to cure them. Sweat lodges were built over a small sulphur springs near the river's edge (Harper 1985). The Warm Springs Indians would often soak in the springs for relaxation and to make use of the water's medicinal properties. The water was taken internally in the belief that it would help to cure many

illnesses. When leaving the area to return to the reservation, the Natives often collected water to take back with them to be used later for its medicinal aid. Since most of this information was collected long after the establishment of the reservations, it is not known if the observed behavior would be typical of the traditional practices of the area inhabitants or a reflection of the Euroamerican methods currently in vogue.

The hot springs were first discovered by early Euroamerican settlers in the 1840's through their associations with the native people in the area. Prehistorically, this region was known to be frequented by the Molalla (Rigsby nd.) as well as several Indian groups that lived east of the Cascade Mountains.

Archaeological Information: The Breitenbush Hot Springs are comprised of over thirty natural hot pools that bubble up from the ground near the edge of the Breitenbush River. The pools are located on two parcels of land and have been designated as the Lower Breitenbush Hot Springs which lies on land administered by the Willamette National Forest, and the Upper Breitenbush Hot Spring which is privately owned. A prehistoric site was first recorded at the Lower Breitenbush Hot Springs during an inventory for a proposed resort reconstruction

project. A resort had been operating at the springs since 1923 which had involved the construction of approximately thirty-five cabins and outhouses with drainfields, a containment around the hot springs source and a hydroelectric development with its associated dam, sluice and powerhouse. The resort had fallen into a poor state of disrepair and renovations were being proposed.

The hot springs are located on the south side of the Breitenbush River in an area that experiences periodic flooding. No cultural material was identified on this side of the river. On the north side of the river, two concentrations of lithic material were found, one area (110m. X 70m.) situated along the river downstream from the hot springs and the second area (30m. X 35m.) located about 110 meters north of the river and the hot springs. A surface collection and subsurface testing of these areas were carried out in 1982 and 1983. Maximum depth of cultural deposits was found to be 97 cm. with disturbance visible in the upper 10 cm.. Cultural material recovered from the test excavations include projectile point fragments, blades, scrapers, drills, bifacially and unifacially-worked flakes and utilized flakes. Many stone artifacts from the site are reported to be in the possession of former resort occupants. No diagnostic projectile points or datable material were found that could be used to help pinpoint a period of occupation.

Informants have stated that all of the points they had seen were of a style believed to represent a relatively late period of occupation (past 200 years). This site has been determined eligible for inclusion in the National Register of Historic Places (Regula 1982) but to date has not been nominated.

The Upper Breitenbush Hot Springs is comprised of over twenty-eight of the thirty hot springs present. This area is currently being purchased by the Breitenbush Community, a private group of individuals who have lived at the springs for the past few years and who make the springs available for the public the year round. Prehistoric cultural material has been found by the springs at a number of locations. Extensive collections are said to be in the possession of past springs occupants but only a small sample of collected material could be located. This material was comprised of many obsidian waste flakes, unifacially and bifacially-worked flakes, utilized flakes, a scraper, pestle and approximately two dozen projectile points. One crude clay ornament (?) was found at the springs but it is not known if it was constructed by the prehistoric or historic occupants of the site. Most of the diagnostic points resembled Rose Spring corner-notched, Desert side-notched and Elko eared which are thought to represent a relatively late period of occupation (past 2000 years).

One Willow leaf point was found in the collection plus the collection's owner recalls seeing other such points which could represent a much earlier occupational period [3,000-7,000 years BP.]. Cultural material is known to be at least 1 meter in depth in some locations and along the banks south of the springs, obsidian flakes can be seen still eroding. Portions of this site have been severely disturbed by logging and construction activities in the past and the collection activities by resort occupants. Many areas, believed to have been once used by area Native inhabitants, appear to remain relatively undisturbed and might still possess significant archaeological potential.

Present Status: The lower springs resort is still in the process of being renovated and is due to be open to the public within the next year. The upper springs continue to attract area residents interested in healing retreats and conferences as well as those wishing to take advantage of the hot springs water. Both areas continue to suffer impacts by construction activities and the collecting of prehistoric material by those visiting the springs.

9. Spring Name...Paulina Warm Springs Site NO#...none

Elevation...6440'

Temperature...119⁰F

Ethnographic Data: No site specific information was found concerning the Paulina Lake area although the area was know to have been utilized by members of the Northern Paiute as well as other area native groups. Paulina Lake is located in the Newberry Crater area, a known source of natural obsidian. This major source of obsidian for central Oregon could have attracted many native groups from throughout the region.

Archaeological Information: An archaeological site was thought to be located near the Paulina warm springs but was believed to have been destroyed by the construction of the Paulina Lake Lodge and it's associated cabins in the early part of this century.

Present Status: The warm springs area, located on the north side of Paulina Lake, was surveyed in July 1984. Small obsidian nodules and flakes could be seen around many portions of the lake with a major obsidian flow,

linking Paulina Lake with East Lake, located 1/4 mile east of the warm springs. The Paulina Lake Lodge is located two miles south of the warm springs.

A large lithic scatter (500m. X 35m.) consisting of over 1000 obsidian interior flakes was found along the northeast shoreline of Paulina Lake surrounding the warm springs. Hot water seeps from beneath the ground into the lake shore and beach area. In historic times, pools have been dug out of the gravel-lined shore to form bathing pools. Over time, the water level fluctuations of the lake and silt deposits fill in these pools and new ones are eventually dug.

No tools or diagnostic artifacts were identified at this site. Any tools that would have been left by early inhabitants have probably been collected by tourists and fishermen who flock to the area every summer. A primitive campground is located near the springs and has probably disturbed portions of the site.

10. Spring Name. South Harney Lake Hot Springs
Site NO# 35HA1029
Elevation...4120' Temperature...141⁰F

Ethnographic Data: No site specific information was located concerning prehistoric use of this springs area. The springs lie within territory occupied historically by the Harney Valley Paiute (Couture 1978).

Archaeological Information: South Harney Lake Hot Springs and its associated archaeological site is situated on land belonging to the Malheur National Wildlife Refuge. The site consists of a small (20m. X 30m.) open surface site adjacent to the hot springs. It was first noted in 1973 by a survey crew from Portland State University. The site may be an outcrop of a much larger site buried by outwash from a large butte located due north of the site. Disturbance to the site has occurred with the construction of a road through the site and dumping activities. Material recovered from the initial survey included one broken basalt drill, two pieces of milling stone, a piece of porcelain and an assortment of obsidian and ccs. flakes. Depth of the cultural deposit was not known.

Present Status: The site was resurveyed in August 1984. Numerous obsidian and ccs flakes were found scattered along the road cut and on a slight rise in land

to the east and south of the hot springs. One utilized obsidian flake and a milling stone was identified. A small pool northwest of the springs source has been improved and is used infrequently by local bathers. The site appears generally undisturbed except for the existing road. The soil is very hard packed and alkaline (white) with the vegetation chiefly comprised of greasewood, grasses and marsh reeds.

11. Spring Name...Cove Warm Springs Site No.# none

Elevation... 2980'

Temperature.. 86⁰F

Ethnographic Data: No site specific information could be found concerning this springs but the area was known to have been frequented by the Nez Perce in historic time.

Archaeological Information: The Cove Warm Springs has been in private ownership for many years and as such has never been involved in any archaeological survey. This spring was first visited in August 1983 and the proprietors mentioned finding lithic material around the

springs area and in their garden, located 200 meters to the east .

Present Status: This site was revisited in August 1984. The natural warm springs has been incorporated into a swimming pool open to the public five months a year. Two large greenhouses (Cove Greenthumb Nursery) have been built east of the springs area and are geothermally heated. The owner has found numerous basalt blades and knives in the garden and springs area as well as a pestle fragment and a piece of ground stone (metate fragment). The land surrounding the springs has been developed in to a picnic area with no cultural material in evidence. No projectile points or datable material were ever found that could be used to help pinpoint the period of occupation. The springs has passed through several owners over the years and no one can recall the use of this spring by Native people.

12. Spring Name..Bonneville [Moffett] Hot Springs
Site #45SA5

Elevation 80'

Temp. 97⁰F

Ethnographic Data: The earliest historic records show that the Columbia Gorge served as a major travel route for aboriginal people throughout the Northwest region. The gorge provided a large resource base that attracted large numbers of people on a seasonal basis. Lewis and Clark were the first Euro-Americans to traverse the Columbia Gorge and to describe its inhabitants. They recorded numerous inhabited and abandoned (seasonal?) villages during their trek to the Pacific in the fall of 1805 and their subsequent return in the spring of 1806 (Thwaites 1959). The Caples site (45-SA-5) is located on an alluvial surface approximately 500 meters east of Greenleaf Slough, near the confluence of Moffett and Greenleaf Creeks. The Moffett Hot Springs lies approximately 520 meters north of the site area. Krieger (1935:56) described this large site:

On the lower portion of the Red Bluff slide near Bonneville on the Washington side of the river, the Indians had taken advantage of the hummock and hollow topography in building at Moffett's Hot Springs one of the largest villages in the area, with circular pits of 35 former houses clearly distinguishable. The hummock forms a wind break around the old hollow, which has been filled to a level flat of several acres extent.

Phebus (1978) compares this site with the description of a village recorded by Clark on October 31, 1805 (Thwaites 1959:3:179);

I observed at this lower rapid the remains of a large and ancient village which I could plainly trace the sinks in which they had formed their houses, as also those in which they had buried their fish.

Phebus believed that the Caples site was the same site that had been described by Clark.

By examining the Clark sketch map (Thwaites 1959:3:172) of the north Bonneville area, Dunnell (1979) found very little similarity between these two sites and believes that Clark actually described a portion of 45-SA-11 or another unrecorded site that has since been destroyed by historic occupation and land modification. Unlike the ancient village described by Clark, 45-SA-5 is not associated with any rapids and cannot be viewed directly from the Columbia River but is located along the Greenleaf Slough. No other information on aboriginal use of this area was identified.

The Caples site was forested at the time of Euroamerican contact and remained so until early in the 20th century when the Caple family logged the land and cultivated it for a number of years. The area was converted into pasture land in the late 1930's (Dunnell & Beck 1979).

The Moffett Hot Springs was first discovered in 1880 by Mr. R.J. Snow, an old miner who was hauling wood to the Cascade steamboat landing. The value of his discovery was quickly recognized and a hotel and bottling works were established. The springs resort passed through many hands and numerous restorations that ended in severe alterations to the original landscape. Any importance that this springs might have held to the area's prehistoric inhabitants was quickly severed with the construction of the early springs resort and past signs of use have long since disappeared.

Archaeological Information: Early excavations at the Caples site were conducted by Herbert W. Krieger in 1934 and George Phebus in 1957 and 1959. They concentrated their efforts on the northern portion of the site, testing a small number of the housepits available. Krieger's work was never reported in any detail and the artifacts that were collected were miscatalogued and effectively lost. This loss of information prompted Phebus to retest the site in the late 1950's. Cultural material recovered from the Caples site included projectile points, blades, drills, gravers, scrapers, mortar fragments, pestles, hammerstones, sinkers, coarse tools, etc.(Phebus 1978). Their investigations indicated

that some of the housepit areas contained areas four feet in depth.

In conjunction with the construction of the Bonneville Dam's second powerhouse, the town of North Bonneville had to be relocated. It's initial relocation threatened to impact the Caples site so that the University of Washington was asked to conduct further investigations in 1975 to evaluate the site's significance to local and regional prehistory. Ten housepits were excavated during the 1975 field season. These housepits revealed several prepared floors that were thought to have been associated with post-supported superstructures (Dunnell & Beck 1979:112). A minimum of forty-one housepits were identified at the Caples site. The ethnographic literature reveals that at the time of contact, pithouses were generally associated with winter occupations (Spier & Sapir 1930:202). One example of a possible surface dwelling was identified and its appearance is consistent with the mat lodges that are described in the ethnographic literature (Spier & Sapir 1930:202-03). Surface houses in the Columbia Gorge were generally associated with summer occupations. Subsistence remains were very limited due to the poor degree of preservation of any organic material. Sturgeon bones were the only evidence recovered that could be identified.

Sturgeon are present in the Columbia River year round. Multiple use of the site can be demonstrated by the superimposition of the housepits but no empirical evidence was found that could suggest the season of occupation.

The age of the Caples site and its locality was determined by analyzing soil data and six radiocarbon samples distributed throughout the site. The area itself appears to have been created after the last major landslide episode which occurred early in the 13th century. By analyzing the six radiocarbon samples and by comparing the recovered projectile points with Pettigrew's (1977) typology developed for the Columbia Valley, Dunnell suggests that the Caples site was occupied from the late 13th century through the 15th century (Dunnell & Beck 1979:48). The complete absence of side-notched projectile points supports the belief that the site was abandoned for a considerable period prior to the entry of trade goods.

The close proximity and possible use of Moffett Hot Springs to the Caples site was not mentioned in any of the reports of the later excavation. Dunnell points out that the Caples site:

...is as large or larger than any similar settlement described by Lewis and Clark for this part of the Columbia Gorge, even taking into account that Caples is surely the product of multiple occupations (Dunnell & Beck 1979:134).

The presence and use of this natural thermal spring might have provided one reason for the location and possible seasonality of this large village.

The Caples site was nominated to the National Register of Historic Places in 1979 as part of the North Bonneville Archaeological District. It has since been accepted and placed on the Register.

Present Status: The Caples site is situated on land protected and administered by the U.S. Army Corps of Engineers. Since the 1975 excavations, the site has slowly been reverting back to nature with the natural vegetation being allowed to flourish. A spiritual health retreat (Biba Hot Springs) is now being developed at the Moffett Hot Springs. The owners have landscaped the central portion of the resort property to allow for the subsequent construction of meditation centers, lodging and an amphitheater. Any archaeological potential for this area has long since been destroyed.

13. Spring Name..Klickitat Warm Spring Site No#.45KL218

Elevation...530'

Temperature..81⁰F

Ethnographic Data: Klickitat Warm Springs consists of a series of warm mineral springs located along the Klickitat River between Klickitat and Wahkiacus, Washington, a distance of three miles. Several of the springs are the result of historic drilling activities but the origin of many of them is unknown since all of them are now encased in cement or have pipes protruding from their source. The name Wahkiacus is believed to be of Indian origin and is defined as "land of flowing waters". The Indians (Cayuse?) were said to have used the spring water for medicinal purposes. The mud from the spring was applied to the skin to aid in the healing of poison oak and for other diseases in need of leaching or drying out. The water was drunk medicinally and local native elders are said to still drink the waters from one spring located just north of Klickitat. An old bottling works, Klickitat Mineral Springs, is located one mile north of Klickitat and was the site of a popular international mineral water corporation.

Archaeological Information: An archaeological site was recorded at the northern most warm spring by Washington State University in June 1979. The site was located around a historic house and cement-enclosed spring and was said to contain projectile points, flakes, cooked bone, hearths, fire-cracked rocks, charcoal and mussel shell. The estimated depth of the cultural deposit was 80cm., with the Klickitat River forming the northern boundary of the site. Artifacts have been collected all along the river terrace from the Wahkiacus spring to another mineral spring located 1/4 mile south. The site lies on privately owned property and has passed through a series of owners over the past 80 years.

The site has been vandalized by local youths for years, leaving its present condition questionable. Most of the recovered artifacts, including a rumored cache of hundreds of trade beads, have long since disappeared. The only artifacts that could be located were owned by the son of the Wahkiacus postmaster. No contextual information or soil stratigraphy had been recorded for the recovered artifacts so their relative association with each other could not be established. The reviewed collection contained many stone mortars, pestles, and a net weight along with over one hundred projectile points. An attempt was made to typologically crossdate the

recovered points using Cressman's (1960) typology for The Dalles area. The observed points compare favorably with Cressman's Type II (a,d,j,k) and Type III (a,g) which belong to the late period of occupation (from 6090B.P. to historic contact). The predominant projectile point style observed from the artifact collection does not appear in Cressman's typology but is very similar to the "desert side-notched" points that appear throughout the Great Basin dating from 800B.P. (A.D.1100) to the historic era (Hester & Heizer 1973:10). The high frequency of this late point style tends to support a recent period of occupation.

A number of copper and iron items and trade beads were also recovered which emphasizes occupation at the time of historic contact. These historic trade items included: a brass military button manufactured between 1840 - 1850 (Woodward 1965), a Phoenix button, Morriss or Hawkbell (Weatherford 1980: type 1A3), copper trade bracelet, and turquoise, glass and soapstone beads. A thick (1 1/2" long X 1 1/4" wide X 1/2" thick) piece of incised clay was also recovered.

An Indian graveyard is located on top of a hill on the north side of the Klickitat River overlooking the site. This graveyard was still being used as late as

1950. Over six isolated burials were uncovered on a terrace directly across the river from the recorded site during the construction of the post office. There is a strong possibility that other burials exist within the area.

Present Status: All of the warm springs located between Klickitat and Wahkiacus have been developed to some extent. The immediate area surrounding each of the springs has been disturbed and in some instances severely altered with the construction of roads, houses or old bottling works. Site 45-KL-218 lies along both sides of a road which intersects the middle of the site. The highest potential area for remaining cultural deposits appears to be near the banks of the Klickitat River.

14. Spring Name..Kennedy Hot Springs Site No.# none

Elevation... 3300'

Temperature.100⁰F

Ethnographic Data: No site specific information was located for the Kennedy Hot Springs area except that the

springs lies within a region known to have been occupied by the Snuqualmi Indians (Gunther 1973:8) and was utilized by a number of other native groups. A few prehistoric trails that traverse the Cascade Range are also known to be located in the vicinity.

Archaeological Information.: A single petroglyph was located near the Kennedy Hot Springs. The symbol, believed to represent the sun, was identified during a survey project involving the nearby ranger station. It is unknown whether this petroglyph was created by prehistoric or historic peoples.

Present Status: Due to inclement weather and schedule conflicts, this spring was not personally surveyed. No additional information is known on the present status of the thermal spring or its associated petroglyph site.

15. Spring Name...Hot Springs Cove

Site No# DiSn2,3

Elevation... 20'

Temperature.122⁰F

Ethnographic Data: Hot Springs Cove lies on the southern border of an Indian Reserve occupied by the Nuuchah-nulth people. The area is the historic territory of the Ahousaht. The hot springs has been and is still currently used by fishermen and native people from the nearby reserve (Taylor 1982, McDonald 1978).

Archaeological Information: Two archaeological sites were located in the vicinity of the natural hot springs on Hot Springs Cove. DiSn2 was a shallow midden site referred to as the hot springs settlement. The site has been totally disturbed over the past fifty years with people inhabiting the site since 1928. One hammerstone was recovered from the site and is now in the possession of an area resident.

DiSn3 is described as a village site located on the east side of the Openit Peninsula. Native people were known to have inhabited the site as late as 1940 and post remains and collapsed structures are still in evidence. The site has suffered from very little visible disturbance. No known artifacts were recovered from the site.

Present Status: This site is inaccessible to nonarea residents during most times of the year except by private plane or chartered boat. Due to schedule conflicts, this site was not personally surveyed. No additional information is known on the present status of the thermal spring or its associated site.

16. Spring Name..Lussier Hot Spring Site No#.EaPv1

Elevation... 4000'

Temperature.110⁰F

Ethnographic Data: No site specific data was available on this spring location but it is known to lie within the historic territory of the Upper Kootenay Indians.

Archaeological Information: A small (10m. X 20m.) lithic scatter was located 1/4 mile upstream from the Lussier Hot Springs along the south bank of the Lussier River in central British Columbia. Several chert flakes,

two side-notched projectile points and a bifacially use-retouch flake were identified. The two side-notched white chert projectile points appear to belong to the Kamloops Phase (Sanger 1968) or Cassimer Bar Phase (Grabert 1968) and date from the late prehistoric period. The late prehistoric period is generally thought to date from 850B.P. to 100 B.P. (A.D.1100 - A.D.1850) (Grabert 1974).

Present Status: The archaeological site is located within the confines of the Lussier Hot Springs Campground. Approximately 20% of the site has been disturbed by camping activities. The depth of the cultural deposit is not known but is thought to be not more than 20cm.. A log pool has been built around one of the hot springs and a bath house built over another. The area is subject to erosion and landslides which have caused severe alterations in the landscape in the past. This spring is quite popular with the area inhabitants and it and the campground receive heavy use.

17. Spring Name..Givens Hot Springs Site No#10-OE-57,
60,1689,1690,1691
Elevation...2280' Temperature.117⁰F

Ethnographic Data: There are numerous diary accounts of early immigrants from the Oregon Trail that describe visiting the Givens Hot Springs area. They record seeing Indians living in "lodges" in the vicinity of Givens during the 1830's and 1840's. While traveling on the southern route of the Oregon Trail, the immigrants report Indians fishing in the Snake River in the Givens area. No other aboriginal site specific information was located. The Givens Hot Springs, being a major stop along the Oregon Trail, quickly developed into a resort which continues today to serve the local residents.

Archaeological Information: A number of prehistoric archaeological sites have been identified in the vicinity of Given Hot Springs including cultural deposits at the mouth of HardTrigger Creek (10OE57,1689), on both sides of the hot springs runoff (10OE60, 1690) and around the hot springs itself (10OE1691). A large boulder containing many petroglyphs was located near the Snake River, downstream from the springs area(Erwin 1930), as well as

a large series of petroglyphs located directly across the Snake that includes Map Rock, a well known rock art piece said to delineate the Snake River and all its tributaries. A housing development was planned in 1978 that would severely impact the archaeological deposits of a number of these sites. The Idaho State Historical Society and the Idaho Archaeological Society conducted major excavations at sites 100E60 and 100E1689 during 1979, 1980 and 1982. No field work was conducted at any of the other previously identified sites.

The excavations at Givens were aimed at locating any house structures and/or activity areas at the site and to try to determine to what extent the role fish had on the diets of the early inhabitants in southern Idaho. The question of seasonality of use for the area was also a major concern. The excavation resulted in the location of eight house structures with their associated hearths, features and trash deposits. Three housepits were located at 100E60 and five were identified at 100E1689. In the ethnographic literature dealing with the Plateau, housepits were generally associated with winter occupation sites. Early travellers along the Oregon Trail reported seeing Indians living and fishing in the Givens area during August which would suggest a late summer-fall occupation.

Cultural material recovered from the housepits included numerous projectile point types, hopper mortar bases, manos, pestles, knives, scrapers, drills and utilized and retouched flakes. Cultural deposits ranged in depth from one meter to 190 cm. (Green 1982a).

Projectile point types identified at the Givens sites included: Northern side-notched, Humboldt, Elko series, Rose Spring and Eastgate points. With the analysis of the collected radiocarbon samples and by cross-dating the projectile point types, the structures were found to range in age from 4300B.P. to 800B.P.. Based on the recovered faunal remains, the age of the deer killed and the lack of bird or salmon remains, Green (1982a) has interpreted the occupation at 100E1689 as representing a winter encampment. Little is known concerning the seasonality of the remaining site until the collected floral and faunal materials are analyzed. The Givens Hot Springs does not appear to be the center of a large winter village such as those described in the ethnographic literature on the Plateau. Rather it appears that Givens was used by two or three families who lived together throughout the winter and possibly at other times of the year.

Present Status: The Givens Hot Springs area was visited in August 1984 and it was found that a private airstrip had been built atop of sites 100E57,60 and 1690. It is uncertain if the construction activities seriously impacted site 100E1689. Site 100E1691, located around the natural thermal spring source, has not suffered any additional impacts. The springs source itself is contained in a 40' cement-walled reservoir that is used to store water to be used at the adjacent resort. Previous construction activities have already caused a considerable impact to any remaining site features.

18. Site Name...Murphy Hot Springs Site No#...none

Elevation...5200'

Temperature.129⁰F

Ethnographic Data: No site specific information was found concerning the Murphy Hot Springs area although it is known to lie within the territory occupied by both the Shoshone and the Northern Paiute (Steward 1938).

Archaeological Information: During the construction of the swimming pool at Murphy's Hot Springs resort by the Civilian Conservation Corps, Pat Murphy located a stone bowl mortar, pestle and a number of eastgate projectile points (Murphy 1984). This projectile point type was known to flourish in the Great Basin from 1250B.P.-650B.P. [A.D.6-700 to A.D.1300] (Thomas 1981, Heizer & Hester 1978). An archaeological site [100E196] was recorded being in the area in 1966. It was located approximately 1/4 mile downstream from the hot springs and consisted of one broken projectile point and lithic debitage.

Present Status... Murphy's Hot Spring was visited in October 1984. The hot springs themselves are located on a steep hillside along the North Fork of the Jarbege River. The resort was first constructed in 1906 and has in the past served the area residents as a major fall hunting camp, swimming and picnic area and as a house of ill-repute called Kitties Hot Hole. The spring water is piped from the hillside to a large swimming pool built next to the river. The valley bottom, adjacent to the river and spring area, has been graded and numerous camper-trailers, houses and a campground now occupy the area. Obsidian flakes were seen along the road cut and camping

area but no tools could be located. In an effort to generate additional income, the owner of the resort is in the process of constructing a number of geothermally heated shrimp pools, similar to those now in operation at Bruneau Hot Springs to the north. The potential for significant archaeological material remaining undisturbed appears very limited.

19. Spring Name...Banbury Hot Springs Site No#...none

Elevation...2900'

Temperature.138⁰F

Ethnographic Data: No site specific information was identified dealing with the Banbury Hot Springs. This area was inhabited by the Shoshoni of Western Idaho who fished all along the Snake River. Winter encampments were generally located below Twin Falls which includes the Banbury Hot Springs area (Steward 1938). A known village site was located two miles west of the hot springs at the confluence of the Salmon Falls River and the Snake River.

Archaeological Information: Two archaeological sites had previously been identified within close proximity of Banbury Springs during the initial archaeological search for spring-related sites. Upon closer examination, both sites were found to be near the Banbury cold springs [58⁰], located directly across the Snake River from the hot springs. No archaeological sites have been recorded in association with the hot springs.

Present Status: Banbury Hot Springs was visited in September 1984. The natural hot springs is located 100 meters south of the Banbury Natatorium. The owner, Catherine Green, has capped the springs source and piped the water to the resort with very little impact having occurred to the area surrounding the springs. At the time of the present visit, the resort grounds were housing a convention for the local John Birch Society and a survey of the springs area was not possible. Bessie Teater, a local resident, recalled Indians camping near the springs during the seasonal fish runs. A large sturgeon run was known to occur in the area and the Indians used to build fish racks near the springs to dry them.

20. Spring Name. White Arrow Hot Springs Site No.# None

Elevation...3320'

Temperature.151⁰F

Ethnographic Data: No site specific information was available during a literature search for the White Arrow Hot Springs area except that the area was known to have been frequented by the Shoshoni and that a known village was located eight miles south along the Snake River (Steward 1938).

Archaeological Information: One recorded archaeological site (10-GG-13) was located in the vicinity of the White Arrow Hot Springs. It consisted of a series of lava tubes displaying a scatter of flakes near the tube entrances. Two typeable points, hopper mortar fragments and a toggling harpoon had been recovered previously. Upon visiting the springs site itself, it was found that the springs bubbles up near the mouth of a canyon and its flow bisects a mountain enclosed valley that eventually drains into Clover Creek 1/2 - 3/4 mile south of the springs source. The present owner, Robert Erkins, has built his house, garage, pool

and several out buildings just downstream from the source and is using the thermally-heated waters to heat a series of greenhouses located by the springs. Archaeological material can be seen throughout the area with obsidian flakes carpeting the landscape and tools and artifacts eroding from the cut banks. The owner has landscaped the property near his home with portions of the hill being cut away to construct his garage. Numerous charcoal lenses, hearths and features were exposed revealing over three meters of cultural deposit. Numerous grinding stones, pestles, knives, scrapers and projectile points were recovered during the construction.

The White Arrow Hot Springs derived its name from the abundance of white arrowheads that were found in the area made of a white volcanic rock. A white layer of rock is said to be located beneath the volcanic tufa that was used for their construction. Hundreds of projectile points have been recovered from the site made from obsidian, cryptocrystalline and crudely flaked basalt. In comparing some of the recovered points with area typologies (Swanson 1972, Gruhn 1961, Heizer & Hester 1978), it was observed that the White Arrow collection included Plainview-McKean, Bitterroot side-notched, Elko-eared, Eastgate split stem, Rose Spring contracting stem and Cottonwood triangular projectile points. These

projectile points represent the past 11,000 years of cultural occupation in this area.

The hot springs area was first settled by Euroamericans 101 years ago. Native Americans were using the springs when the area was visited by Euroamericans and they continued to use it until long after the turn of the century and the Shoshone-Bannock wars. Mrs. Thomas, a local resident, has lived in the Clover Creek-White Arrow spring area all her life and her mother was the first white born in this region. She recalled the Indians arriving every spring and camping near the hot springs. They stayed there for a short time before following a trail up over the canyon (N. of the springs) to Camas Prairie in time for the spring camas harvest. From there she was told they would head north to the Sawtooth Mountains to hunt and fish before returning to Camas Prairie in the early fall to harvest choke cherries and other available berries. They then returned to the hot springs and spent the remainder of the fall. Before the arrival of winter, the Indians would head south towards the Snake River Canyon to camp. During the Shoshone-Bannock War, many Indians died of smallpox while camping at the hot springs. The disease so decimated the group that they could not bury their dead in their traditional manner and instead placed them in the empty lava tubes

along with the burial goods that always accompanied them. The Smithsonian Institute was investigating archaeological sites in the central Idaho area in the late 1920's and 30's and, with the assistance of Mrs. Thomas, located and excavated numerous burials. No record could be located to document the Smithsonian's fieldwork. Mr. Erkins has followed the trail, north of the hot springs, up into the canyon and has located numerous rock shelters and rock art sites that to the best of his knowledge have never been recorded. Excavations have been conducted along Clover Creek, approximately a mile west of the springs, by Idaho State University a few years ago. One Folsom point and pottery fragments have also been recovered from the creek bed in the past but they had been carried down from an unknown location.

Present Status: Except for the immediate area around the owner's house and pool, the landscape has not undergone any drastic alteration. The site appears to have been used, at least intermittently, throughout the past 11,000 years and still maintains a high degree of integrity. Much information remains that could be used in reconstructing the past lifeways of this area's early inhabitants.

21. Spring Name. Soda [Steamboat] Springs Site No.# None

Elevation... 5700'

Temperature. 88⁰F

Ethnographic Data: Soda Springs played an important role in the settlement of the Northwest. A major landmark along the Oregon Trail, it offered the early settlers a long-awaited respite from the hardships of the trail and the lack of water that they had too often endure. The Soda Spring's area, located along the Bear River, served as a major camp for groups of trappers, travellers and Indians passing through the region. The springs were actually comprised of over 1,000 springs that were spread out along the Bear River for over 1/2 mile. Their appearance was one of the most looked for and written about phenomena seen along the trail. Large white mounds could be seen jutting up from the plain bubbling water from the cone tops and emitting sulphurous gases. A few of the more remarkable springs could be seen sprouting water a considerable distance into the air and as, in the case of Steamboat Spring, roared like a steamboat.

A large Indian village, occupied by the Cache Valley Shoshoni, was located near Soda Springs and was often referred to in the journals of the early pioneers (Williams 1922, Eaton 1974). This site was visited by many members of the Bannock-Shoshone Nation as well as members of the Blackfeet and other area groups with a major Indian trail leading to the springs from Blackfeet (Daughters of the Utah Pioneers n.d.). The Native residents, as well as the early pioneers, were quick to realize the range of potential offered by the area's environment and utilized every possible material found at hand in their daily endeavors. The earth around Steamboat Springs, one of the hottest and more visible springs, was the color of ochre and the Indians would use it for painting themselves (Moore 1920). Other springs produced large beds of a snowy white clay. According to Osbourne Russell (1834), this clay was used by the Indians for cleansing their clothes and their skins, "it not being inferior to soap for cleansing woolens or skins dressed after the Indian fashion" (Halverson 1971:252). A greasy substance left in some of the springs was used by many of the early white travellers as a lubricant for their wagon wheels (Simmons 1983).

The Indians were said to believe that the waters of Lava Hot Springs, another area thermal spring, were

hallowed and possessed of natural powers. The early tribal chiefs had agreed to set the area aside as neutral ground for all tribes to use in peace. It is not known if the area inhabitants considered Soda Springs in a like manner.

Archaeological Information: No archaeological sites have ever been recorded near the soda springs themselves even though a historically-documented Indian village was known to be located in the area. Soda Springs, and Lava Hot Springs forty miles west, were both settled at an early period, which tended to destroy any archaeological sites that were located in the vicinity. The Alexander Reservoir was built near the town of Soda Springs during the mid 1900's, which inundated Steamboat Springs and most of the springs that had previously been the area's main attraction. A few open camp sites have been recorded around the hills that border the present town of Soda Springs to the west but nothing is known of any sites that were once located along the valley floor.

Present Status: Soda Springs was visited in September 1984 and it was found that only two springs remain from the 1,000 that originally dotted the

landscape. One of these springs was a hot water geyser that had been drilled in 1937 and is timed to go off every hour on the hour. The other is Hooper Spring, a 50⁰F mineral (soda) spring located five miles north of the city, has been enclosed in a park. The potential for identifying native uses of the once prolific thermal springs is now nonexistent.

22. Spring Name.. Pine Flat Hot Springs Site No#.10-BO-52

Elevation... 3700'

Temperature.138⁰F

Ethnographic Data: No site specific information was found for this area but the ethnographic records show that the Mountain Shoshone were known to inhabit the area and that the Northern Paiute were living downstream (Steward 1938, Liljeblad 1972).

Archaeological Information: A large prehistoric campsite was discovered approximately 1/4 mile east of the Pine Flat Hot Springs on a small second order terrace above the south fork of the Payette River. The site was

first discovered by a Forest Service employee during the construction of Pine Flat Campground. He remembered uncovering flakes, projectile points and hearths during the construction. The site was officially surveyed in 1978 by Boise State University (Moore & Ames 1979) and was found to cover areas on both 1st and 2nd terraces. The site occupying the lower terrace measured 30m. X 15m. and had an estimated depth of less than 1.5 meters. Two obsidian cores (bidirectional), river cobble net weights and fire-cracked rocks were identified with depressions which could be housepits. Another small (30m. X 15m.) open site area was found on the second large terrace above the river. This site has been severely disturbed by the construction of the Forest Service campground. The slopes between the upper and lower terraces revealed ground stone tools, manos and metates.

Present Status: This site was visited in September of 1984. The lower terrace has had a road and gravel lot built over the majority of the site. Portions of the site not destroyed by road construction is covered by thick duff allowing poor visibility. Four obsidian flakes (one utilized) were identified. The upper large terrace has been altered by the construction of a road system and gravelled camping areas. Obsidian flakes can be found

eroding from the terrace edge. A local camper remarked on finding three-four small side-notched projectile points along the terrace edge and obsidian flakes further down a trail that leads to the hot springs.

23. Spring Name..Stanley Hot Springs Site No# 10CR198
& 199

Elevation... 6220'

Temperature. 106⁰F

Ethnographic Data: No aboriginal site specific information was found for the Stanley Hot Springs area except that it lies within territory frequented by the Nez Perce and Fort Hall and Lemhi Shoshone (Steward 1938). The confluence of Valley Creek and the Salmon River, located just downstream from the springs, was a major salmon spawning area which could have been a major attraction for the areas inhabitants. During the early part of the 20th century, a resort was built at the springs that attracted a considerable number of people. The resort closed its doors to the public in 1970 due to the soaring expense involved in running the resort and the increase in vandalism.

Archaeological Information: Two archaeological sites were recorded in 1964 near the confluence of Valley Creek and the Salmon River. Both sites are located around the hot springs and seeps that comprise the Stanley Hot Springs. Site 10-CR-199 extends along the west side of Highway 93 for approximately 1/4 mile and consists of three or four distinct circular patterns of different vegetation and an indefinite number of indistinct ones which suggested a possible temporary habitation site. A small scatter of flaked stone artifacts were seen to cover the area with no appreciable soil depth being noted (Bowers 1964).

Site 10-CR-198 is situated along the east side of Highway 93 at the river's confluence and is intersected by hot springs and seeps. Portions of this site had previously been destroyed by highway construction. A high concentration of flaked tools and broken pieces of chipped rock were found along the higher areas of the terrace with surface indications pointing to small concentrated occupation areas over the site. The site is located on a much lower terrace than the surrounding area and is thus more subject to the seasonal effects of flooding and erosion. The soil above the river gravels

was found to be shallow but its potential for information was thought worthy of future excavations (Bowers 1964).

Occupation of the Sawtooth Mountains was largely determined by the climatic conditions and limited food resources. The discovery of sites in this high Alpine Zone would indicate seasonal migration to the higher elevations. Bowers (1964) believed that the Sawtooth Mountain area was only used marginally by the Native peoples and that the occupations were either salmon or hunting oriented. The Stanley Hot Springs area is over 6200' in elevation, which would place it in a spring - fall Nez Perce subsistence resource procurement area thought to be oriented towards the acquisition of fish and plant resources (Schwede 1970). The extreme altitude of the sites and their location near one of the largest salmon spawning grounds in the area would tend to suggest a spring-fall occupation centering on the harvest of available fish.

Present Status: The Stanley Hot Springs area was resurveyed in September 1984. Both previously-recorded sites were examined in order to discover what degree of archaeological potential remained. Site 10-CR-198 was found to be partially inundated and its general condition

to be very marshy. Obsidian flakes could still be seen along the road berm and creek slopes but the site itself could not be adequately examined. Site 10-CR-199 was located near the site of the old Stanley Hot Springs bath house and pool (circa 1930's - 10CR659). Due to increased use and vandalism the resort was torn down some years ago and the surrounding area bladed. The area has been totally destroyed by past construction (destruction) activities. Several large holes were found of unknown origin. A survey of the area resulted in the identification of three interior obsidian flakes and two basalt flakes but no tools were located. Any archaeological potential this area might once have had for revealing the site's past use and seasonality of occupation has long since disappeared.

24. Spring Name.. Challis [Beardsley] Hot Springs

Site No# 10CR187

Elevation 4960'

Temperature 123⁰F

Ethnographic Data: No site specific information for the Challis Hot Springs area was identified but the site is known to be in the territory historically occupied by the Lemhi Shoshone of central Idaho (Epperson 1977). John

Work (1971), an employee of the Hudson's Bay Company during the mid 1800's, recorded in his journals that the "Bannock Snakes" have lately encamped at the hot springs (Work 1971).

Archaeological Information: Two small rockshelters were located 1/5 mile south of the hot springs overlooking the broad floodplain of the Salmon River. The site has been potted prior to 1968 and human skeletons were removed. Additional bone fragments and several flakes were collected from the backdirt piles at the time this site was recorded. Pictographs were visible along the back wall of the shelters.

Present Status: Challis Hot Springs was resurveyed in September 1984. Site 10CR187 is located 3 meters above the present spring road with dense underbrush obscuring the entrance to both shelters. Shelter floors have been excavated with but a few chert flakes in evidence. Red pictographs are in very faded condition and show evidence of vandalism. Designs are largely illegible though numerous circle and abstract designs can still be seen.

The hot springs consist of a series of spring outlets running west from a large hillside across the flood plain for approximately 200 meters. The current springs resort is built just west of the series of springs. The resort manager had uncovered a large cache of small projectile points in a hay field just south of the hot springs. A farmhand has since taken the points and no accurate description could be obtained. Additional points had been recovered near the creek (100m. from springs) and along the hillside to the east of the resort. Human burials are known to exist along the talus slopes near the springs but their exact location is guarded to protect them from future vandalism.

The broad flood plain of the Salmon River stretches west from the hillside towards the river and encompasses the series of thermal springs and resort area. A large portion of this flood plain has suffered disturbances of at least the upper 20cm. of deposits due to farming activities and resort construction. The potential for significant sites remaining in the spring area is thought to be high.

25. Spring Name... Boulder Creek Warm Springs
Site No#.10AM45

Elevation...3080'

Temperature.82⁰F

Ethnographic Data: No site specific information was available for the Boulder Creek Warm Springs area but it is known to lie in territory occupied by the Nez Perce and Shoshoni bands (Steward 1938).

Archaeological Information: A possible village site and a small rock shelter were located near the mouth of Boulder Creek where it joins the Little Salmon River. The village site was said to be located along a small cove west of Boulder Creek with a small (24' across) rock shelter located on a hill slope directly to the south. No description or number of artifacts recovered from the site or reasons associated with the identification of this area as an archaeological site (village) were given. The site was recorded in July 1958.

Present Status: Boulder Creek Warm Springs area was resurveyed in September 1984 and it was found that the area is now encompassed in a housing complex that extends

along both sides of Boulder Creek. Boulder Creek Warm Springs are comprised of seven springs located within a 1/2 mile area all along the south side of Boulder Creek. Each spring differs in size and shape with an average temperature of 80⁰F.

Believed to be the location of the possible village site, the area has been grated and gravelled. A series of roads bisects the entire area with gravelled trailer lots placed on the flatter parcels of land. The rock shelter, located on the southern edge of this complex, has been destroyed and in 1976 a large house was built on top of the rock ledge. The present owner of the house moved into it one year ago and knew nothing of any archaeological sites. The housing complex has changed ownership numerous times over the past ten years and any recovered archaeological material has long since disappeared. The home owner has found obsidian flakes throughout the 1/2 mile area encompassing the thermal springs, from the river's confluence to the old resort site, but has seen no tools or projectile points.

A thermal spring, located on the western edge of the shelters terrace, flows from mid March to July. During this period of the year the water table is at its highest and the spring bubbles out of the rocks and flows down

the hillside to the lower terrace. The season of occupation at this site is not known but if it had served as a winter village, fresh water would have been available to its occupants without ever leaving the rockshelter's immediate area. This could have greatly enhanced the attractiveness of the site as a prime occupational location.

26. Spring Name..Jerry Johnson Hot Spring

Site No# 10IH880

Elevation...3200'

Temperature.118⁰F

Ethnographic Data... Shawley (1977) states that Jerry Johnson Hot Springs served as a possible Nez Perce campground. A major Nez Perce trail is known to have passed close by the springs area. No other site specific information was located.

Archaeological Information: Jerry Johnson Hot Springs was surveyed by the Clearwater National Forest in 1978. Two chert flakes and one basalt flake was found near the trail head leading into the spring area. No

artifacts were recovered near the springs themselves. R.L.Sappington confirmed the use of Jerry Johnson Hot Springs as a prehistoric camp in 1977 but just what information he might have located is not know.

Present Status: Jerry Johnson Hot Springs is one of the most popular Idaho hot springs. It is used all year round by backpackers from Idaho and Montana. The springs area has suffered continued disturbance by campers while still remaining in its primitive state. This hot springs was resurveyed in September 1984. The springs area is very overgrown with a thick understory severely limiting ground visibility. Three interior chert flakes were identified along the primitive trail approximately 300 meters north of the springs. No tools or diagnostic artifacts were seen.

SUMMARY

A surface survey is undoubtedly biased toward the recovery of more recent artifact forms since they are more likely to be found on or near the surface of a site. Typeable projectile points or other datable cultural material present on the site's surface can reveal information concerning the period of occupation and use of the site at one (most recent) period but it generally reveals very little information about possible past periods of occupation and use. Both ethnographic and archaeological evidence suggest that older artifacts were often collected, reused and redistributed within a site by later groups. Such reuse may have been similar in function to the original use of the artifact as with grinding stones and projectile points, or may have been adapted for some new function such as the use of milling stones as cooking rocks (Kelly 1932).

The distribution of the identified projectile points has only a limited interpretive significance due mainly to their being surface material found at heavily-disturbed sites. Those few sites that have undergone archaeological excavation, in turn, yield more significance. To date, there are no well-developed

comprehensive studies of prehistoric lithic technology that provide us with dependable models of the temporal significance of the morphological variations of artifacts. Some general temporal models have been developed for portions of the Pacific Northwest (Heizer & Hester 1978, Leonhardy & Rice 1970, Swanson 1972, Pettigrew 1977, Thomas 1981) but none have attempted to analyze satisfactorily the interregional style variations. These typologies furnish a basic structure from which the temporal distribution of projectile points found throughout the region can be compared to but they provide little towards the assigning of artifacts to specific regional affiliations.

On the basis of the available regional models, the projectile points found at the surveyed thermal spring sites appear to represent periods of occupation spanning the past 11,000 years. Of the twenty-six surveyed sites, eleven revealed no time sensitive material, making it impossible to place any perimeters on their past period of use. Extensive collecting activities had taken place at each of these sites. One site (White Arrow) yielded an artifact assemblage that encompassed the entire past 11,000 years of occupation. This material was revealed during the construction activities at the site. Five sites (Menlo Baths, King's Dog, Kelly, Foley and

Belknap), all located in the Cascades or Great Basin resource areas, yielded dates spanning the past 7-8,000 years. Most of these sites have undergone archaeological excavations and/or severe ground-disturbing activities which would have allowed for the exposure of deeply-buried subsurface materials. Givens Hot Springs yielded C¹⁴ dates and temporally sensitive projectile points that helped date the site's occupation from 4,300 B.P. to 800B.P.. The eight remaining springs sites (Kitson, Breitenbush, Klickitat, Moffet, Hot Springs Cove, Lussier, Murphy and Soda Springs) all have yielded late prehistoric material (A.D.1400 - Historic Present).

In order to reconstruct prehistoric adaptive patterns, one must focus attention on the direct evidence available such as a site's location and the nature of the recovered archaeological assemblage. The location is selected in regards to the relationship between the archaeological site and its environmental setting. It is assumed that the distribution of sites is at least partly a function of subsistence elements (i.e., people tend to live as close as possible to the food resources that are most important to them). Site locations are often influenced by factors such as the nature of a water source, an appropriate terrain for camping or the presence of lithic material.

Of the twenty-six sites studied, 80% were located near a fresh water source that would have provided cold water for drinking and various other uses. Terrain suitable for a temporary or seasonal camp was generally available within close proximity of all the spring sites. The position of a seasonal or temporary campsite to a thermal spring would necessarily depend upon the desired use of the spring's water or environment. If the springs was used for utilitarian purposes such as basketry, hide preparation, food preparation and bathing, the camp would most likely have been located close to the springs source. If the springs was used primarily as a hunting locale, the camp would have to be located some distance away so as not to frighten away game. Areas used by the Nez Perce for sweat baths (i.e., hotsprings) were frequently located downstream from the main settlements. Archaeological remains observed at each of the surveyed sites revealed no evidence that could be used to determine if a thermal springs was utilized by the areas early inhabitants or if it was, in what way it might have been utilized.

Information on seasonality could only be inferred for five of the thermal springs sites (King's Dog, Menlo Baths, Kelly, Moffett and Givens). All of these sites are

believed to represent winter villages which supports the belief that thermal springs ideally would have provided an excellent wintering location most suitable to the various prehistoric inhabitants of the Pacific Northwest regions. This is not to say that springs were not used during the other seasons of the year but that these seasons were focused around the necessary procurement of subsistence resources which forced a group to stay fairly mobile while the winter months would have provided the most intensive period of sedentary occupation. The need to remain fairly mobile during the majority of the year was much more emphasized in the Great Basin where food resources were often unpredictable from year to year.

None of the documented uses of thermal springs found in the ethnographic literature leave any archaeological evidence behind that would reveal how a specific springs was once used. In most instances, very little modification was done to the spring's environment. The naturally-heated water was the focus of their attention and it was in a process of constant renewal. The few modifications to the environment that were fashioned would have been in the form of stone pools to trap the water or temporary structures built over the springs that were used as a sweat lodge. The lodges would be dismantled after use or would decay within a few years,

leaving behind no recognizable sign of their existence, and the stone pools would either be destroyed by seasonal flooding or be incorporated by Euroamericans for their use. There would be no way of telling if a pool was constructed twenty or two hundred years ago. The existence of Indian trails leading to a springs or the close proximity of seasonal villages help to point out the knowledge of this feature but not its specific use.

By examining the archaeological evidence, one can often reconstruct the activities that occurred near a site and its position within the yearly subsistence cycle. Analysis of those sites associated with thermal springs could reveal information useful in determining what area resources were being exploited and the season and time period the site was in use. Specific uses of the springs water can only be implied by examining the little information that is retained in the ethnographic literature and by working with the Native American in recording any knowledge of past uses that are still recollected.

An attempt was made to work with numerous native groups located throughout the Pacific Northwest. Over a dozen native tribes and/or reservations were personally contacted in an effort to record any information that

might still be retained on the past use of thermal springs. A few nations could not recall how thermal springs were once used by their people. In light of the early reservation policies that forcibly removed many Native American groups from their traditional territories and placed them on reservations, often far from areas that they were familiar with, it is easy to understand how information not immediately needed for survival could be forgotten. The remaining Native American groups declined to participate in this research endeavor. A few of these groups are known to still use thermal springs for a variety of reasons but they were not presently receptive to sharing this information. Much of this knowledge is retained only by a small number of tribal elders and, as time passes, will quickly be lost forever. If this information could be collected and compared with the ethnographic accounts, a clearer picture could be developed that would add insight as to the role of this environmental feature in the development of an area's settlement and subsistence patterns.

VI. PRESENT DEVELOPMENTAL STATUS AND NATIVE AMERICAN CONCERNS

The Pacific Northwest has long depended on its natural resources. The harvesting of timber and the harnessing of the rivers for power have been key elements in the development of the region. An available and inexpensive energy source continues to be a factor in the growth and prosperity of the Northwest. Geothermal resources in the Pacific Northwest have been recognized as having considerable potential for generating electricity and in providing heat for direct applications. The search for possible uses for this resource has been ongoing in a limited degree for the past ten years. The development and use of this resource has branched out into a number of heat-related fields. Geothermal heat is now being used at several locations throughout the Northwest for spaceheating, agriculture, aquaculture and industrial processing. This activity is expected to increase in the near future (Dellinger et al. 1982).

Several environmental concerns about the development of geothermal resources have been brought up by Native American groups throughout the western United States. Some of the major concerns include items such as water rights, water pollution, possible reduced flow at hot

springs, reduced surface water runoff, air pollution and possible infringement of religion because of changes in access to important religious areas or to impacts on areas of religious importance (Clusen 1980:4-22). Geothermal drilling often results in the natural hot springs being fenced off and capped, with the water being diverted and depleted from excessive drilling. In considering geothermal developments, the Department of Energy (DOE) has identified the protection of sacred sites as a potential problem area during the evaluation procedures required in the 1978 American Indian Religious Freedom Act (AIRFA) (Public Law 95-341). It has attempted to integrate this process into the environmental review process which has already been established (Environmental Impact Statement). If the investigation finds that a DOE-proposed action would infringe on a site that is currently the location of religious practice, consultation with the Native American traditional religious leaders would take place to gain an understanding of the type of impacts involved. If consultation indicates that the proposed DOE action may infringe on the free exercise of religion, alternative plans will be prepared in cooperation with the Indian leaders which would not infringe on the free exercise of religion. The United States Supreme Court has ruled that the Federal Government may not abridge the free exercise of religion unless there is a "compelling governmental

interest." In cases where no alternative is feasible and the DOE's proposed action is deemed to be compelling and must proceed, the finding and justification must be reviewed and approved by the Secretary of the Interior. This process was instituted to insure that fair treatment would be given to all parties involved and to protect their freedoms covered by AIRFA (Andrus 1979:27-28).

The American Indian Religious Freedom Act was passed in hopes of redressing "the abridgement of religious freedom for traditional American Indians" by government agencies by guaranteeing their (Steiner 1981:14):

...freedom to believe, express and exercise the traditional religions [through] access to sites, use and possession of sacred objects and freedom to worship through ceremonials and traditional rites.

The terms of this act were never adequately defined. What constitutes a sacred site or object? Traditional ceremonies and rites often take place at a mountain, river, cave or special spring that has religious importance. Steiner (1981:14) also states that "the earth itself is a sacred object - it is the church, and the earth's natural phenomena are the altars of Indian Religion."

"Few notions run more deeply against the American grain than the idea that the land and its trees, rocks and streams might be as 'alive' and sacred as a flag or

crucifix" (Practicing Anthropology 1982). There is a strong possibility that the specifically religious aspects of sacredness are jeopardized by legal remedies. Depending on the various interpretations of sacredness in implementing AIRFA, the result may be further distortion and restrictions of native rituals and beliefs rather than their revitalization. Native American religious leaders feel that AIRFA is forcing the Indian tribes to locate, describe, and reveal sacred areas, religious rites, and objects to the various federal agencies in order to obtain the protection intended under the law (Clusen 1980:J-6). They do not feel that this type of information becoming a matter of public record in an Environmental Impact Statement was the intent of the law, the purpose of which is (Public Law 95-341 [see Appendix]):

... to protect and preserve for Native Americans their inherent right of freedom to believe, express, and exercise the traditional religions of the American Indian, Eskimo, Aleut, and Native Hawaiian, including but not limited to access to sites use and possession of sacred objects and the freedom to worship through ceremonial and traditional rites.

Native people believe that certain areas of land are sacred. These lands may be sacred because they contain specific natural products, are the dwelling place of spiritual beings, surround or contain burial grounds or are sites conducive to communication with spiritual beings. For many cultures, lakes, ponds and springs are

considered especially sacred because spirits of the underworld use them for access to and from the natural world. In the past Native Americans have been denied access to sacred sites on federal lands for the purpose of worship. "Sacred sites have been needlessly and thoughtlessly put to other uses which have desecrated them" (Andrus 1979:Executive Summary). Andrus also states (1979:54):

Physical access to the land and its natural products must also include the preservation of the natural conditions which are the sine qua non of that access.... Changing of physical conditions-- the spraying and logging of trees, unlimited trapping or removal of original species, alteration of the terrain through river channelization, dams and other methods-- not only damages the spiritual nature of the land but may also endanger the well-being of the Native religious practisioners in their role and religious obligation as guardians and preservers of the natural character of specific land areas.

Many Native Americans throughout the western United States, including the Pueblo Indians of the Southwest, believe that the drilling and other activities associated with geothermal energy production upset the balance of nature. If man upsets the balance of nature, that damage is permanent and can never be reversed, thereby resulting in negative impacts to the world at large. Geothermal activities are thought to invade the underworld. They contaminate the underground water supply, alter its natural flow and reduce its surface abundance.

Several thermal springs sites have been threatened with destruction by industrial developments during the past ten years. Representatives of the Southwest region's Native American groups, for example, have gone to court in hopes of gaining protection for this important resource. Construction of a geothermal electrical power plant is now underway near Jemez Hot Springs in the Jemez Mountains of New Mexico. In the Final Environmental Impact Statement, the Department of the Interior acknowledged that geothermal development was a potential threat to the area's natural and cultural resources. "Potential conflicts are mentioned in the categories of air quality, water quality, visual impacts, noise, quality of wildlife habitat and cultural resources" (Taylor 1981:5). The Native Americans in the area of the Jemez Mountains have long used the Jemez Hot Springs for purification and curing. The Baca Ranch Geothermal Demonstration Program was found to have a direct affect on the Jemez Springs and Soda Dam thermal areas of New Mexico. The geothermal development would reduce the temperature, flow and mineral content of the hot springs. The Pueblos of New Mexico have fought for the preservation of these springs and have lost. In the case of the Baca Ranch Program, no alternative plans were offered to avoid infringing on areas found to have religious importance. Instead, a mitigation plan was

offered that attempted to reduce the infringement (Clusen 1980).

Skagg's Hot Spring in northern California was destroyed when the U.S. Army Corps of Engineers constructed the \$240 million dollar Warm Springs Dam. The Pomo Indians used Skagg's Hot Spring as a healing center. Their sacred source of angelica, an herb used for spiritual connection to one's inner being, grew near the hot springs and was destroyed by the dam (Garfield 1983). Other springs in the southwestern United States have met a similar fate. The projects affecting each of these springs appear to have had a "compelling governmental interest".

The Department of the Navy have entered into an access agreement with the Owens Valley Paiute and Shoshone Band of Indians which provides for the Indian religious use of the medicinal muds and waters of the Coso Hot Springs area. The Coso Hot Springs, located east of Sacramento, have figured prominently in the Indians' religious history of the area as a sacred place for spiritual and physical renewal and curing (Andrus 1979:56). The Department of the Navy acquired the Coso Hot Springs area after World War II and established the China Lake Naval Weapons Center there. Because of the use of the site for storage of ammunition, security

regulations were instituted that denied public use of and access to the springs. Following extensive discussion between the Department of the Navy and the Native American religious leaders, some restrictions were lifted to allow tribal members access and use of the springs area.

Up to now, most of the major impacts to geothermal sites in the Northwest have been the result of construction of resorts. The Willamette National Forest is currently working on a management program that would maximize the recreational opportunities inherent at their hot springs sites and minimize the health and safety problems. Their preferred alternative is to develop resort facilities at a number of their spring sites. Major geothermal developments are now being proposed for many areas of the Pacific Northwest. The potential conflict between these developments and Native American religious and other uses of thermal spring sites have just begun to be realized. The Department of the Interior has developed a list of springs areas [1982] marked for geothermal development throughout the western states. Some of these areas have already been made off limits to the general public (see Appendix for list).

The need to evaluate the significance of thermal springs has become an immediate concern. Further research

including the collection of oral histories must be done in the near future. Native Americans must move to protect those sites that are of spiritual importance to their people before the Federal Government earmarks them for development. Cases in the past have shown that when the government has decided to develop a spring location, Native American religious concerns do not seem to be regarded as an important enough precedent to alter the industry's location. Native Americans need to insure the protection of their spiritual sites prior to the sites being threatened if they hope to be able to save them. It appears that where matters of money are concerned, the urge to develop will continue to outweigh the cultural and conservation ethic.

Cultural Resource

The term "cultural resource" is never defined implicitly in any of the Federal laws dating from 1906 to 1984 but it is implied within each law or its Code of Federal Regulations that is issued to help the various state and Federal agencies understand the implications of each law. The most comprehensive definition found was listed in the Code of Federal Regulations governing Soil Conservation Corp. assisted programs for the protection of archaeological properties (CFR part 656.4a). It states that cultural (historical, archaeological, architectural)

resources mean districts, sites, buildings, structures and objects of local, state and national significance which are listed in or meet the eligibility criteria for inclusion in the National Register of Historic Places (NRHP). Public Law 96-95 further defines cultural resources to include: pottery, basketry, bottles, weapons, weapon projectiles, tools, structures or portions of structures, pit houses, rock paintings, rock carvings, etched stone, graves and human skeletal material that are at least 100 years old.

Included in this term "cultural resource", as defined by the Soil Conservation Service Regulations, are the historical, archaeological and architectural resources subdivisions. Individual definitions appear for the first two of these categories within the Federal laws. Historical resources are defined in HR 5496 as being any prehistoric or historic district, site, building, structure or object included or eligible for inclusion on the National Register. Such terms include artifacts, records and remains of past life or activities which are of archaeological interest. Each of the above definitions emphasizes the importance of "material remains" in defining a cultural resource. For the most part, this is due to the fact that the identification of past cultural materials is the only way to insure the accurate location of a past activity area. By using

ethnographic and oral history data , one can often identify cultural features without the aid of any cultural remains, especially when the feature is a stable part of the area's environment (i.e., landmark sites).

When considering thermals spring locations, the current definitions are not appropriate. The specific tasks incorporating thermal springs mentioned in this report leave behind no visible evidence of past use or importance. Nonsprings oriented activities such as campsites or lithic reduction occurring near a thermal springs might leave behind physical evidence from these past activities but they cannot be related to the spring's use. Thermal springs represent a rare and renewable natural resource, utilized through time in a variety of cultural scenarios.

The ultimate objective of Steward's (1955) concept of 'cultural ecology' is the study of the interaction of physical, biological and cultural features within a locale or unit of territory (Steward 1955:31). He believes that cultural ecological adaptations constitute creative processes. This would place the thermal springs environment well within the realm of "cultural resource." The present laws need to be expanded to encompass this possibility and archaeologists need to be aware of the cultural diversity of this environmental feature.

VII. CONCLUSION

It is evident that the thermal springs environment was variously occupied and/or utilized by the Native inhabitants of the entire Pacific Northwest, at least intermittently, for over the past 11,000 years. Thermal springs provided a year-round water source with unique mineral properties, attractive to both man and animals. Native people often camped near the hot springs because they wished to use the waters, they could more easily harvest the game attracted to these areas, and they could use the silicified stone deposits often associated with hot springs for tool making. The early inhabitants recognized the diversity offered by such springs and made use of their properties in improving many aspects of their life. The springs served in assisting utilitarian tasks, physical and spiritual therapeutic functions and as a primary link to the spirit world. The degree of incorporation of this kind of feature is evidence of the importance that it played in aboriginal societies.

The thermally-heated environment offered an ideal winter village location and was utilized in this manner throughout the Northwest. The heated waters continued to flow year round, providing ice free locations for the

hunting of fowl and fish, and attracting large game during the winter months when food supplies were often very low. Hunting would be one of the only opportunities to supplement a native's diet. Its incorporation into the settlement and subsistence patterns during other times of the year depended on the quality and quantity of an area's food resources and the dependability of these resources from year to year. Those areas where resources were more reliable could more easily incorporate thermal sites into their seasonal round.

The ethnographic accounts provide a variety of information detailing the various uses of the thermal springs environment. These include use of the heated waters or the clay/mud that surround the springs. None of the practices employing the springs leave behind any sign of use that can be archaeologically substantiated as being of native origin (i.e., stone pools). The thermal waters represent a renewable resource that could be used continuously over time without fear of exhaustion.

The archaeological record often reveals information that can be used to reconstruct the settlement and subsistence patterns of early human inhabitants. It has the potential of yielding information that can be used to determine the season of use, time range of occupation and possible activities carried out. This data base has the

capability of helping to explain much of the prehistoric lifeways of prehistoric human population but reveals nothing that can be used to reconstruct the past use or importance of thermal springs. Whether the springs were the major variable determining the site's specific location or but a minor attribute cannot be determined through the archaeological record.

A reliance on documentary and oral history data is, thus, necessary in order to establish the role of this environmental feature. Documentary accounts reveal many observations of Native springs use written by untrained non-native people. The validity of the observations and interpretations must therefore be questioned. The observed use of the springs would most likely represent a fairly accurate account of what was seen, with the interpretation having the possibility of greater bias. Direct Native testimony offers a more accurate interpretation of past springs use but it, too, must be questioned. Native Americans have been forcibly enculturated into mainstream White society for over 400 years. The recorded Native uses of thermal springs should be compared to the early Euroamerican uses to allow for a possible diffusion of cultural practices. On the whole, Native American testimony offers a more reliable data base and when combined with the ethnographic accounts of regional uses, helps to establish the role of this feature among Native

peoples.

In order to accurately determine the use by and importance of thermal springs to Native Americans, one should examine the available archaeological and ethnographic information as well as interview the local Native Americans. All three sources of data should be considered before a determination can be made on the past importance of this resource. This report offers cultural resource managers an initial data base showing the diversity and widespread use of natural thermal springs. This information points out the integration of them into many facets of the daily labors and spiritual beliefs and practices of Native Americans. These springs were, and in many areas are still, an important element of the lifeways of Native people. A wholistic approach must be taken in order to properly evaluate the importance of these springs before management recommendations can be made.

To Native Americans, this report offers further insight into the past role of these springs prior to the disruption of Native culture by Euroamericans. In time, this study will hopefully stimulate interest in Native identity and contribute to the restoration of a sense of Indian ethnicity.

There is a high probability of finding both

prehistoric and historic cultural resources in association with any hot springs. Using this initial premise, one can demonstrate the presence or absence of such use by archaeological survey, ethnographic review and by interviewing local Native Americans. Effective management and development of a valuable resource can only be done with full knowledge of the resource. Nothing should be done until this necessary data base is available. With the expected increase in development of thermal springs throughout the Pacific Northwest, one can foresee potential conflicts between Native American concerns, the protection of archaeological resources and proposed projects. Steps need to be taken in the near future to identify those areas of special concern to insure their protection. This report offers a data base that can be used to help recognize the importance of the thermal springs environment.

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IX APPENDIX

ELEVATIONAL STUDIES

A comparison was made between the elevations of the 98 identified ethnographic villages and archaeologically-associated sites to see if any pattern could be seen in the distribution of sites between cultural regions and seasonal resource areas. Of the 98 identified sites, 47 were located in the Plateau Cultural Region, 33 in the Northern Great Basin and 18 in the Northwest Coast. Given the boundaries of the project area included in this report, the Plateau encompasses the greatest land area and therefore it is not surprising that it also contains the greatest number of archaeologically-associated thermal springs sites. Figure 8 plots the range in elevation for each of these sites.

E L E V A T I O N S	6500'		2	
	6000'		6	1
	5500'		3	2
	5000'		4	2
	4500'		3	6
	4000'		6	14
	3500'		3	1
	3000'	2	10	
	2500'	1	6	5
	2000'	2	1	2
	1500'	3	1	
	1000'	1	1	
	500'	2	1	
	0'	7		
		N.W.Coast	Plateau	N. Great Basin
Total		18	47	33

Figure 8: Elevational Range of Regional Thermal Springs Sites

By analyzing the above data for each cultural region with the known or believed elevational ranges for area winter villages, a temporary assessment can be made concerning the period or seasonality of use at these sites. Only one thermal springs site in the Northwest Coast is currently believed to be a winter village (Moffett). This site is approximately 80' above sea level. Sites in the Northwest Coast area located in areas less than 1000' in elevation (9) would fall within a range generally thought to have been used during the winter by Native groups. The remaining nine sites are all located in the foothills of the Cascade Range. It is possible that some of these were also visited during the winter months but the climate and heavy snowfall would detract from long term occupations. This estimate is made considering the present temperature range in the Northwest and does not take into consideration the effect of the altithermal (7,000 - 4,500 B.P.) whose warmer climate would allow for more prolonged use of locations in the higher elevations. Winter village sites have been located in northern California in the Northwest Coast Region at elevations as high as 3200' (Skagg's Hot Springs). There is a chance that thermal springs sites that lie within the 2000' to 3000' level in the upper Northwest Coast Region could also represent winter village locations.

Schwedes (1970) study on the relationship of aboriginal Nez Perce settlement patterns to the physical environment and the distribution of food resources, found that winter villages were predominantly located in the lowland areas between 500' and 1500' in elevation. Three springs sites fall within this elevational range and two of these (Riggins, Kah-Nee-Ta) represent known Nez Perce and Northern Paiute winter village sites. All of the remaining 44 spring sites are located in elevations higher than 2500' which, according to Schwede would represent seasonal camps. One major factor that must be considered in this analysis is that many of the major early hot springs resorts located less than 1500' in elevation have never been surveyed. The lack of this information tends to skew the present data. The high proportion of seasonal (higher) camp sites might be balanced out by the lower spring site locations if an accurate survey of all the available thermal springs was completed. The high proportion of springs sites having archaeological sites above 2500' in elevation might represent the importance of this resource to the Native people throughout this area and the reliability of their resource base. Subsistence resources were fairly dependable and predictable, which allowed the Plateau people more freedom in selecting areas for harvest. The abundance of food resources also would have allowed them

more nonsubsistence-oriented time when thermal springs sites might have been visited.

The Northern Great Basin Region contains 33 identified archaeological and/or ethnographic springs sites. Thirteen of these have been found to represent winter village sites which were located 5000' and below in elevation. This range encompasses 29 of the 33 identified sites. The four remaining sites are all located above 5000' and might represent areas that were visited during the seasonal subsistence cycle. The heavy concentration of archaeological sites within the range known to have been occupied during the winter might emphasize the importance and scarcity of water throughout the Great Basin rather than any particular importance that the thermally-heated waters might have had. However, the various ethnographic uses of thermal springs within this region that are documented in this report appear to suggest that this environmental feature would serve very well as a winter occupational location and the archaeological record adds some support to this hypothesis. Additional research is needed throughout all three culture regions before we can fully evaluate the role of this feature.

TEMPERATURE EVALUATION

A study of the range in temperatures exhibited at the archaeological thermal springs sites was conducted to see if sites or specific springs functions seemed to cluster around any particular temperature range. The 98 archaeological thermal springs sites range in temperature from 68⁰F to over 200⁰F. No obvious patterns or clustering could be seen concerning their distribution within each culture region. Temperatures of springs known to have been used for specific tasks also exhibit no pattern.

Medicinal bathing appears to have been conducted at springs ranging from 68⁰F to 198⁰F, although most of the known examples (94%) have temperatures of 95⁰F or hotter. Springs known to have been used for medicinal mud baths range in temperature from 81⁰F to 198⁰F, and for internal consumption , from 68⁰F to 198⁰F. The only significantly narrow temperature range exhibited for a specific spring function was with the springs that had been incorporated into the sweatbath practice. They ranged from 140⁰F to

198⁰F. The temperature range needed to induce sweating would need to be over 100⁰F and the hotter the temperature the more one would sweat.

Winter villages are known to have been located at springs having temperatures as low as 88⁰F and as high as 205⁰F. The chief qualities sought for in the thermal waters appear to be the higher than area temperatures for the water so that the water would not freeze during the winter months, and the possible mineral quality of the water. The particular degree of temperature variation does not appear to have been a major factor in selecting a springs for occupation or a specific task. The sample of springs studied for each ethnographically-documented use is very small and further research is needed before any conclusions can be reached regarding the role of temperature variation.

TABLES

Information for Tables 1 - 5 was collected from unpublished raw data files and from personal reconnaissance. The majority of the data was taken from the individual archaeological site forms that were on file at the various State Historic Preservation Offices and regional government offices (Oregon SHPO 1983, Idaho SHPO 1983, Washington SHPO 1983, California Northeast Information Center 1983, British Columbia Resource Management Division 1983). An Index to the abbreviations used for each of the tables is given below.

TABLE 1

Summary of Basic Social Structure and Subsistence Resources
of Northwest Cultural Regions (after Rice 1970)

	Plateau	Great Basin
Primary Subsistence Activity	Fishing	Food Gathering
Most Imp. Vegetal Product	Roots [camas, kouse]	Seeds [pinon/grass]
General Dependability &	Dependable	Variable
Stability of Subsistence Resource	Predictable	Unpredictable
Basic Form of Social Organization	Composite Band	Loose Family/ Patrilineal Band
Basic Political Unit	Village	Family

	Coastal Region	Valley
Primary Subsistence Activity	Fishing	Root Crops
Most Imp. Vegetal Product	Berries	Camas, Wapato
General Dependability &	Dependable	Dependable
Stability of Subsistence Resource	Predictable	Predictable
Basic Form of Social Organization	Family or Extended Family	Patrilocal Band
Basic Political Unit	Autonomous Village	Village

	Cascade Range
Primary Subsistence Activity	Hunting
Most Imp. Vegetal Product	Berries
General Dependability &	Dependable
Stability of Subsistence Resource	Unpredictable
Basic Form of Social Organization	Family
Basic Political Unit	Family

TABLE 2

Medicinal Use of N.W. Thermal Springs

HWB = Hotwater Bath

IC = Internal

Consumption

MB = Mud Bath

SL = Sweat Lodge

Temp F = Temperature Fahrenheit

TABLE 2

Medicinal Use of Northwest Thermal Springs

	Spring Name	HWB	InC	MB	SL	Temp F
1	Eucott Bay	X				129
2	Hot Spring Cove	X				122
3	Skookumchuck	X	X			129
4	Harrison	X	X			154
5	Halcyon	X				115
6	Radium	X				109
7	Fairmont	X				120
8	Sol Duc	X	X			122
9	Olympic	X				118
10	Garland	X				84
11	Klickitat	X	X	X		81
12	Breitenbush	X	X	X	X	198
13	Ka-Nee-Ta	X	X			126
14	Medical Springs	X			X	140
15	Sam-O	X				80
16	Mt. Vernon	X				121
17	Belknap	X	X			160
18	Foley	X		X	X	176
19	McCredie	X		X		163
20	Kitson	X	X			109
21	Tokatee	X				117
22	Jackson	X				95
23	Buckhorn	X	X			68
24	Eagle Ridge	X				95
25	Klamath	X			X	156
26	Kelly	X	X	X		198
27	Skaggs	X	X			135
28	Calistoga	X	X			172
29	Magic	X				109
30	Lava	X	X			113
31	Riggins	X	X	X		106
32	Red River	X		X		131
33	Stuart				X	Hot
34	Hot Lake	X				176

TABLE 3

Summary of Thermal Spring Rock Art Site Information

Petr = Petroglyph	Pict = Pictograph
Dist = Distance from Spring	Elev = Elevation
Temp = Temperature in Fahrenheit	HF = Human Figures
QP = Quadrepeds	Lz = Lizards or Snakes
Ci = Circle/Circle with dot	CC = Concentric
Circles	
DL = Double Loop	S = Sun
PL = Parellel or Horizontal Line	AB = Abstract Designs
Unk = Unknown	

TABLE 3

Summary of Thermal Spring Rock Art Site Information

Spring Name	Petr	Pict	Dist	Elev	Temp	HF	Op	Lz	Cf	CC	DL	S	PL	AD	UK
Bassett Hot Spr.	X		0.00	4140	173										X
Crump Hot Spr.	X		0.25	4534	104	X	X							X	
Lake # 19	X	X	>.25	4300	80	X	X	X	X	?	X			X	
Owyhee Reservoir	X		0.00	2720	108			X	X		?			X	
Kennedy Hot Spr.	X		>.12	3300	110							X			
Indian Bathtub	X	X	0.00	2700	158		X		X					X	
Givens Hot Spr.	X		0.25	2280	117	X	X	?	X	X			X		
Challis Hot Spr.		X	0.20	4960	109				X	X				X	
Hospital Hot Spr.		X	>.12	4000	115	X							X		
Dagger Creek		X	0.25	5600	110										X
Warm Springs		X	0.00	6480	84		X						X		
Radium Hot Spr.		X	0.25	3275	109	X	X						X		

TABLE 4

Ethnographically Documented Thermal Spring Village Locations

Spring Name	Village Name	Tribal Affiliation	Reference
1 Eucott Bay		Bella Coola	McDonald 1978
2 Skookumchuck	nq' mpa	Lillooet	Bouchard 1983b
3 Halcyon		Kootenay/Colleville	McDonald 1978
4 Radium		Kootenay	Kootenay Nat'l Park
5 Fairmont		Kootenay	Harrington 1970
6 Bingham		Umatilla	Searcey 1972
7 Medical		Nez Perce	Baxter n.d.
8 Hot Lake		Umatilla, Nez Perce Cayuse	Union County Museum
9 Lehman		Umatilla	Suphan 1974
10 Kah-nee-ta	la'xwaixt/wana'i'tay	Northern Paiute	Suphan 1974, Murdock 1938
11	Kowa'cdi	Klamath	Spier 1930
12	Sle'tski	Klamath	Spier 1930
13		Klamath	Spier 1930
14	Lu'lukuashti	Klamath	Gatschet 1890
15	Di 'tklaks	Klamath	Spier 1930
16 Olene		Klamath	Howe 1968
17 Turner/Patuchek		Klamath	Howe 1968
18 Klamath		Modoc	Anderson n.d.
19 Kelly	Astikiwi/Astariwa	Astariwawi	Wheeler-Voeglin 1974
20 Bassett	Sustadja/Sustadedje	Achomawi/Atsugewi	Wheeler-Voeglin 1974
21	Pag'ushuhad	Wad'atkuht Paiute	Riddell 1960
22 Wendel	Pam	Honey Lake Paiute	Riddell 1960
23 Amedee	Pam	Honey Lake Paiute	Riddell 1960
24	Ka'howali	Pomo	Barrett 1908
25 Highland Spring	Kawo axe	Pomo	Barrett 1908
26 Skaggs	Kaho 'wani	Pomo	Barrett 1908
27 Riggins	Weh-min-kesh	Nez Perce	Shawley 1977
28 Givens		Shoshoni ?	Green 1982a
29 Hot Spring		Shoshoni	Murphy & Murphy 1960 Steward 1938
30 Lava		Bannock-Shoshoni	McLain 1979, Franzen 1981
31 Steamboat Spr.		Bannock-Shoshoni	Eaton 1974, Halverson 1971

Table 5

Summary of Thermal Spring Archaeological Site Data

Elev = Elevation

H = Presence of Hunting Tools [projectile points,atlatls]

FP = Food Processing Tools [milling
stones,mortars,pestles]

F = Fishing Tools [harpoons,net or line weights]

LD = Lithic Debitage

ST = Site Type

LS = Lithic Scatter

Vil = Village

HP = House Pit

RS = Rockshelter

SR = Scarred Trees

Blnd = Hunting Blind

Midd = Midden

Q = Quarry

RA = Rock Art

AW = Adjacent to Fresh Water S = Seasonality of Use

RelA = Relative Age[BP] (C^{14} dates or Proj.

Pt.crossdating)

LP = Late Prehistoric [AD1500 - Historic Present]

Cnd = Present condition of the Spring Site

Dist = Disturbed

Undi = Undisturbed

Exc = Excavated

Unkn = Unknown

RA = Rock Art

B = Burials

CR = Culture Region

GB = Great Basin

P = Plateau

NWC = Northwest Coast

* = Selected Archaeological Site

TABLE 5

Summary of Thermal Spring Archaeological Site Data

	Spring Name	Site No.#	Elev	H	FP	F	LD	ST	AW	S	ReLA	Cnd	RA	B	CR
1	Kelly	CA-MOD-1795	4383	X	X		X	LS		W	9000	Dist		X	GB
2	Bassett	CA-LAS-434	4140	X	X		X	Vil		F		Dist	X		GB
3	Leonards	CA-MOD-226	4560	X	X		X	LS				Dist			GB
4	Boyd	CA-MOD-215	4500	X	X		X	LS				Dist			GB
5	Seyferth	CA-MOD-212	4600	X	X		X	HP ?				Dist			GB
6	King's Dog *	CA-MOD-204	4500	X	X		X	HP		W	7000	Dist			GB
7	Menlo Baths *	CA-MOD-197	4250	X	X		X	HP	X	W	7000	Dist			GB
8	Wendel *	CA-LAS-28	4010	X	X		X	Vil	X	W		Dist			GB
9	Paulina Lake *	None	6440				X	LS	X			Dist			P
10	Lake #18	35-LK-745	4300		X		X	HP ?	X			Dist	X		GB
11	Crump	35-LK-644	4534	X	X		X	LS	X			Undi	X		GB
12	Hot Lake	35-UN-2	2700				X	LS				Dist			P
13	Alvord	35-HA-392	6000	X			X	LS	X			Undi			GB
14	Harney Lake *	35-HA-1029	4120		X		X	LS	X			Dist			GB
15	Starkey Warm Spr.	4-35-10	4300		X		X	LS				Dist			P
16	McCredie	None	2079	X			X	LS	X			Dist			NWC
17	Kitson *	35-LA-260	1600	X			X	LS	X		LP	Dist			NWC
18	Foley *	None	1760	X			X	LS	X		7000	Dist			NWC
19	Toketee	35-00-232	3050				X	LS	X			Dist			NWC
20	Cove *	None	2980		X		X	LS	X			Dist			P
21	Medical	None	3387	X	X		X	LS				Dist		X	P
22	Breitenbush *	35-MA-51	2240	X			X	LS	X			Test			NWC
23	Belknap *	35-LA-459	1760	X			X	LS	X			Dist			NWC
24	Kennedy *	None	3300					RA				Undi	X		NWC
25	Klickitat *	45-KL-21B	530	X	X	X	X	LS	X		LP	Dist		X	P
26	Orr Creek	45-SA-100	2580				X	ST	X	S		Undi			NWC
27	Moffett *	45-SA-5	80	X	X	X	X	HP	X	W ?	800	Exc			NWC
28	Saint Martins	None	240	X	X	X	X	LS	X			Dist			NWC
29	Weir Creek	10-IH-446	2880				X	LS	X			Unkn			P
30	Jerry Johnson *	10-IH-880	3240				X	LS	X			Dist			P
31	Stanley	Idaho 56	3600				X	LS	X			Unkn			P
32	Givens *	10-OE-1691	2280	X	X		X	HP	X	S&W	4300	Exc	X		GB
33	Murphy *	None	5200	X	X		X	LS	X		1250	Dist			GB
34	Indian Bathtub	10-OE-517	2700	X			X	RS	X			Dist	X		GB
35	Indian Hot Spr.	10-OE-339	3700				X	RS	X			Dist			GB
36	Spr near Ind. BT	10-OE-442	2625				X	LS	X			Unkn			GB
37	Mud Springs	10-OE-2614	2400	X	X		X	LS			5000	Dist			GB
38	Banbury *	None	2900				X	X	LS	X		Undi			GB
39	Lava	None	5002					Vill	X			Ostr			GB

TABLE 5 (continued)

	Spring Name	Site No.#	Elev	H	FP	F	LD	ST	AW	S	RelA	Cnd	RA	B	CR
40	Soda Springs *	None	5700					Vill	X			LP	Dstr		GB
41	Cleveland	10-FR-3	4940				X	LS	X				Dist		GB
42	Hemmett	10-BL-14	5947	X	X		X	LS	X			LP	Dist		GB
43	Boulder Creek *	10-AM-45	3080				X	LS	X				Dist		P
44	Russian John	10-BN-20	6800	X			X	LS					Unkn		P
45	Sunbeam	10-CR-2	6000					Blnd	X				Unkn		P
46	Challis *	10-CR-187	4960	X			X	LS	X				Dist	X	P
47	Stanley *	10-CR-199	6220				X	LS	X				Dist		P
48	Little Antelope	10-CR-249	5800	X			X	LS					Dist		P
49	Basin Creek	10-CR-371	6060	X				Blnd	X				Undi		P
50	Cox	10-CR-592	4120	X			X	LS	X			LP	Dist		P
51	Sunflower	10-VY-133	4300	X		X	X	LS	X			LP	Undi		P
52	Bowery	10-CR-839	6720	X			X	LS	X			8200	Undi		P
53	Hospital	10-VY-16	4000		X		X	RS					Unkn	X	P
54	Dagger Creek	10-VY-28	5600					RA					Unkn	X	P
55	Sheep Eaters	10-VY-79	5100	X			X	HP	X			3500	Dist		P
56	Barth	10-IH-180	2700				X	Vil?	X				Dist		P
57	Riggins	10-IH-40	1781	X			X	LS	X				Dist		P
58	Barney	10-CR-541	6404				X	LS	X				Dist		P
59	Sullivan	10-CR-702	5550				X	Q	X				Dist		P
60	Sheep Creek	10-EL-236	3480	X			X	LS	X				Undi		P
61	White Arrow *	None	3320	X	X		X	LS				110000	Dist		P
62	Atlanta	10-EL-242	5400				X	LS					Dist		P
63	Tea Pot Dome	10-EL-551	3500	X	X		X	LS					Dist		P
64	Danskin Creek	10-BO-47	3200	X	X		X	LS	X				Dist		P
65	Pine Flat *	10-BO-52	3700	X			X	HP	? X				Dist		P
66	Hot Spr. Campgr.	10-BO-105	3140	X	X		X	LS	X				Dist		P
67	Carie(Condie)	10-BN-2	4764				X	LS	X				Unkn		P
68	Carbarton	10-VY-8	4720				X	HP	? X				Dist		P
69	Trail Flat	10-VY-77	5440	X			X	HP	X			2000	Dist		P
70	Lidy	10-CL-125	5300				X	LS					Undi		P
71	Warm Springs	10-CL-131	6480				X	RS	X				Dist	X	P
72	Lussier *	EaPv1	4000	X			X	LS	X			LP	Dist		P
73	Wild Horse River	DJPv33	3100	X			X	LS	X				Dist		P
74	Fairmont	EbPx14	2600				X	HP	X				Dist		P
75	Radium	EdQa4,5	3275				X	LS	X				Dist	X	P
76	Red Rock	EbPw5	3300				X	LS	X				Undi		P
77	Hot Springs Cove*	DiSn2,3	5				X	Vill	X			LP	Dist		NWC
78	Skookumchuck	DIReH4	500				X	HP	? X				Undi		NWC
79	Eucott Bay	FcSt6	15					RS	X			LP	Dist	X	NWC
80	Nascall Bay	FcSt3	20		?		X	LS	X				Dist		NWC
81	Hot Spring Island	FdTu4	18				X	Midd	X				Undi		NWC

HOT SPRINGS HOT LIST

The following springs are on the Department of Interior's hot list for Geothermal Development. Some have already been made off-limits to the general public.

Oregon: Mount Hood; Carey Hot Springs; Breitenbush Hot Springs; Belknap-Foley Hot Springs; McCredie Hot Springs; Burns Butte; Vale Hot Springs; Summer Lake Hot Springs; Alvord; Klamath Falls; Crump Geyser; Cougar Hot Springs.

Washington: Kennedy Hot Springs, Indian Heaven.

New Mexico: Valles Caldera; San Ysidro; Lower Frisco Hot Springs; Gila Hot Springs; Radium Hot Springs; Kilbourne Hot Springs; Jemez Hot Springs.

Arizona: Clifton & Gillard Hot Springs; Hookers Hot Springs; Chandler; Casa Grande.

Nevada: Beowave; Bradys Hot Springs; Ruby Valley; Dixie Valley; Soda Lake; Steamboat Springs; Baltazor; Black Rock Desert; Golconda; Gerlach; Rye Patch; Leach Hot Springs; San Emidio; Kyle Hot Springs; Buffalo Valley; Crescent Valley; Dixie Valley; Waltham; Brady-Hazen; Stillwater; Salt Wells; Smith Creek; Wabuska; Allen; Wilson; Alkali Flat; Gabbs; Fish Lake Valley; Clayton Valley; Pyramid Lake; Monte Neva; Walleye; Darrough Hot Springs.

Utah: Roosevelt Hot Springs; Cove Fort - Sulpherdale; Termo; Beryl; Crater Springs; Neels; Hatton; Monroe-Joseph; Minersville; Lund; Enoch; Navajo Lake.

Colorado: Mt. Princeton; San Luis Valley; Mineral Hot Springs; Valley View Hot Springs.

Wyoming: Strawberry; Afton.

Montana: Warm Springs; Ennis Lake; Corwin Springs; Marysville.

California: The Geysers; Lake City (Suprise Valley); Mammoth; Niland; Brawley; Heber; East Mesa; Mt. Konocti; Borax Lake; Mayacmas Mountains S.W. of Middleton and N.E. of Calistoga; Lake Crowley; Glass Mountain; Bieber; Susanville; Honey Lake;

Bartlett; Hopland; Skaggs; Knoxville;
Bridgeport; Long Valley; Coso; Lava Mountain;
Newberry; Kelly; Menlo; Lassen; Sierra Valley; Wilbur
Spring; Mono Lake; Tecopa; Arrowhead; Hot Mineral
Wells.

Ten springs from the 81 known archaeologically-
associated springs sites mentioned in this report are on
the above list of springs to be developed in the near
future. This list was published by the Hot Springs
Information Network, Dallas, Texas in 1982. Some of
the above springs have already suffered major impacts if
not complete destruction.

PUBLIC LAW 95-341—AUG. 11, 1978

92 STAT. 469

Public Law 95-341
95th Congress

Joint Resolution

American Indian Religious Freedom.

Aug. 11, 1978

[S.J. Res. 102]

Whereas the freedom of religion for all people is an inherent right, fundamental to the democratic structure of the United States and is guaranteed by the First Amendment of the United States Constitution:

Whereas the United States has traditionally rejected the concept of a government denying individuals the right to practice their religion and, as a result, has benefited from a rich variety of religious heritages in this country;

Whereas the religious practices of the American Indian (as well as Native Alaskan and Hawaiian) are an integral part of their culture, tradition and heritage, such practices forming the basis of Indian identity and value systems;

Whereas the traditional American Indian religions, as an integral part of Indian life, are indispensable and irreplaceable:

Whereas the lack of a clear, comprehensive, and consistent Federal policy has often resulted in the abridgment of religious freedom for traditional American Indians;

Whereas such religious infringements result from the lack of knowledge or the insensitive and inflexible enforcement of Federal policies and regulations premised on a variety of laws;

Whereas such laws were designed for such worthwhile purposes as conservation and preservation of natural species and resources but were never intended to relate to Indian religious practices and, therefore, were passed without consideration of their effect on traditional American Indian religions;

Whereas such laws and policies often deny American Indians access to sacred sites required in their religions, including cemeteries:

Whereas such laws at times prohibit the use and possession of sacred objects necessary to the exercise of religious rites and ceremonies:

Whereas traditional American Indian ceremonies have been intruded upon, interfered with, and in a few instances banned: Now, therefore, be it

Resolved by the Senate and House of Representatives of the United States of America in Congress assembled, That henceforth it shall be the policy of the United States to protect and preserve for American Indians their inherent right of freedom to believe, express, and exercise the traditional religions of the American Indian, Eskimo, Aleut, and Native Hawaiians, including but not limited to access to sites, use and possession of sacred objects, and the freedom to worship through ceremonials and traditional rites.

American
Indian Religious
Freedom.
42 USC 1996.

92 STAT. 470

PUBLIC LAW 95-341—AUG. 11, 1978

42 USC 1996
note.Presidential
report to
Congress.

SEC. 2. The President shall direct the various Federal departments, agencies, and other instrumentalities responsible for administering relevant laws to evaluate their policies and procedures in consultation with native traditional religious leaders in order to determine appropriate changes necessary to protect and preserve Native American religious cultural rights and practices. Twelve months after approval of this resolution, the President shall report back to the Congress the results of his evaluation, including any changes which were made in administrative policies and procedures, and any recommendations he may have for legislative action.

Approved August 11, 1978.

LEGISLATIVE HISTORY:

HOUSE REPORT No. 95-1308 accompanying H.J. Res. 738 (Comm. on Interior and Insular Affairs).

SENATE REPORT No. 95-709 (Comm. on Indian Affairs).

CONGRESSIONAL RECORD, Vol. 124 (1978):

Apr. 3, considered and passed Senate.

July 18, H.J. Res. 738 considered and passed House; proceedings vacated and

S.J. Res. 102, amended, passed in lieu.

July 27, Senate concurred in House amendment.