

ETHNOECOLOGY OF THE INEL AND THE EASTERN SNAKE RIVER PLAIN

The eastern Snake River Plain is a region of cultural and natural edges. Ethnographically, it forms the northeastern fringe of the Great Basin², but its aboriginal inhabitants were in many ways distinct from their cousins in the Great Basin proper, at least during the past 4,500 years. The Plain is adjacent to the northern Plateau area of deeply incised mountain ranges and relatively more abundant water (Figure 21). The Rocky Mountains to the east formed a psychological barrier, if not a physical one, between the Basin-Plateau and the Plains cultures.

The flora of the INEL and immediate vicinity includes much of the diversity of plant species adapted to the environmental extremes found within the region. Nearly 500 plant species have been identified on the INEL itself, one-third of which have potential uses for humankind. Many more are relied upon by over 200 seasonal and resident species of vertebrates (Ringe 1995) and hundreds of

hundreds of insect species (Stafford et al. 1986, Stafford 1987, Youtie et al. 1987). Information on known and potential uses of some of the region's ethnobotanically or ethnoecologically important plants (those that have features or inhabit places that

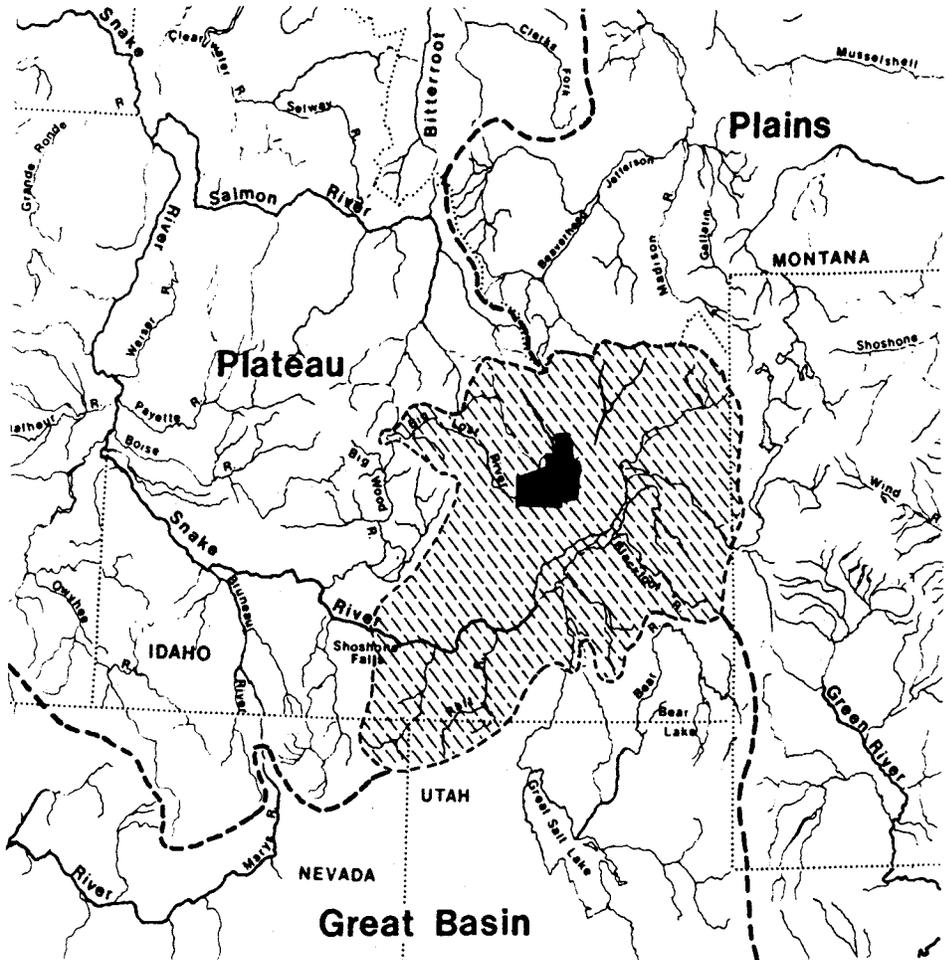


Figure 21. Cultural areas adjacent to the eastern Snake River Plain (hatched area) (from Reed et al. 1987).

are especially attractive to humans) can be found in tabular form at the end of this section. The remainder of this section will be devoted to assessing the ecological and environmental determinants of human occupation or use of the eastern Snake River Plain through a brief summary of the region's prehistory and history. The INEL itself is central to the area of study and is representative of many, though not all, aspects of the region's ecology as it pertains to human use.

² In *The Desert's Past*, archaeologist Donald Grayson (1993) refers to four separate definitions of the Great Basin: the hydrographic, the physiographic, the floristic, and the ethnographic. The floristic and ethnographic Great Basins include all of the Snake River Plain. The hydrographic and physiographic Great Basins only flank the southeastern edge of this region along the Idaho-Utah and Idaho-Nevada borders.

Prehistoric Human Occupation

The first human beings to tap the resources of what we now call the Snake River Plain likely were descendants of people who crossed the Bering Strait land bridge; they arrived here some 11,000 B.P. That date was obtained from cultural deposits in Owl Cave (Wasden Site) just east of the INEL (Figure 22). A date of 14,500 B.P. was obtained three decades ago during the infancy of radiocarbon dating from deposits in Wilson Butte Cave (Figure 22), 200 km southwest of the INEL (Gruhn 1965); however, newer dating techniques applied to the same deposits provided dates younger than 11,000 years B.P. (Meatte 1989). Other archaeological sites on the Plain, in caves and lava tubes, along the shorelines of rivers and lakes, and in the foothills, have established that humans have occupied the Snake River Plain and its edges more or less continuously ever since. Over 850 archaeological sites at the INEL indicate a slow, steady increase in use of the area during that period (R. Holmer, personal communication; Figure 23). Palynological and archeological studies show that plant species composition on the

Snake River Plain has changed little during the Holocene (the past 10,000 years) (Davis and Bright 1983, Davis et al. 1986, Steadman et al. 1994), but the altitudinal distributions and relative abundances of individual species likely were different during the Altithermal, a period of gradual warming and drying during the early to mid Holocene. Studies in the area indicate a peak in xeric conditions between 8,200 and 6,700 B.P. (Beiswenger 1991); however, warm and dry conditions apparently persisted on the eastern Snake River Plain at least until 5,500 B.P. (Davis 1981). A change in projectile point morphology around 7,500 B.P. suggests a shift in hunting technology (Figure 23). Another shift around 4,500 B.P. may have corresponded with occupation of the area by migrants from the south following the close of the Altithermal. The widespread climatic shift to more arid conditions during the early Holocene may have caused the earliest human inhabitants of the Plain to follow the moist conditions to which they were accustomed to higher latitudes, thus opening a niche on or around the Plain for people migrating north from the comparatively more aird conditions in the south. According to this hypothesis, the Plain's original inhabitants were ancestors of the Plateau or Plains

cultures to the north, while some-time during or toward the close of the Altithermal, ancestors of the present day Northern Shoshone and Bannock (Northern Paiute) emigrated north from the Great Basin and took up residence on the Snake River Plain (Holmer 1994). Until the last decade this hypothesis had little support from the archaeological record, but data from two recently discovered sites are consistent with it. A camp site at Dagger Falls on the Middle Fork of the Salmon River shows Shoshonean cultural continuity from 4,000 B.P. to historic times, and the sacred Wahmuza site on the Fort Hall bottoms shows similar continuity from 2,000 B.P. (Torgler 1995, Holmer 1994). The temporal, contextual, and artifactual overlap between these two sites seems to confirm continuous Shoshonean presence in southern Idaho since the close of the Altithermal.

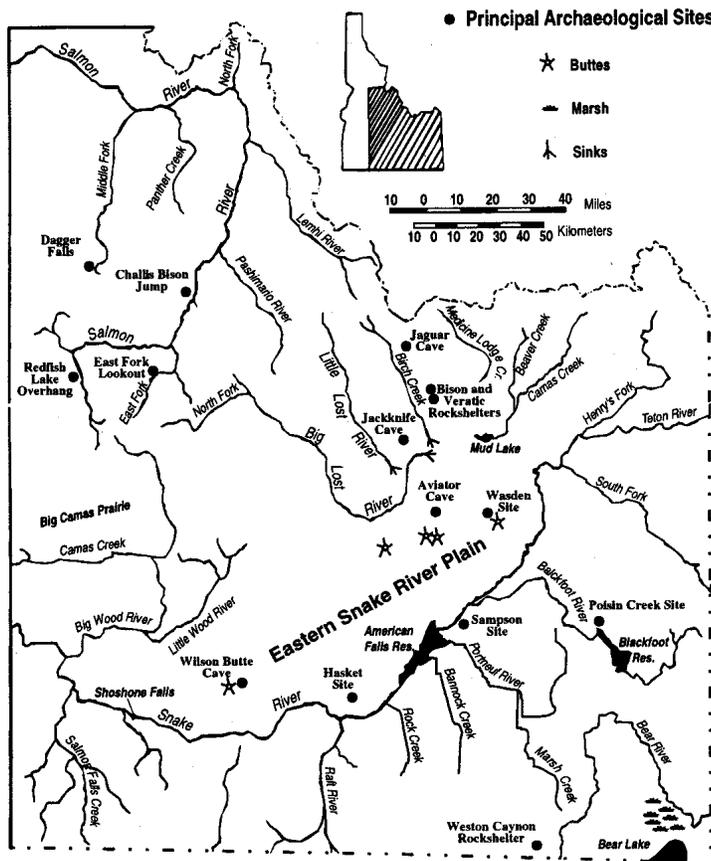


Figure 22. Important archaeological sites of the eastern Snake River Plain and nearby areas (redrawn from Reed et al. 1987).

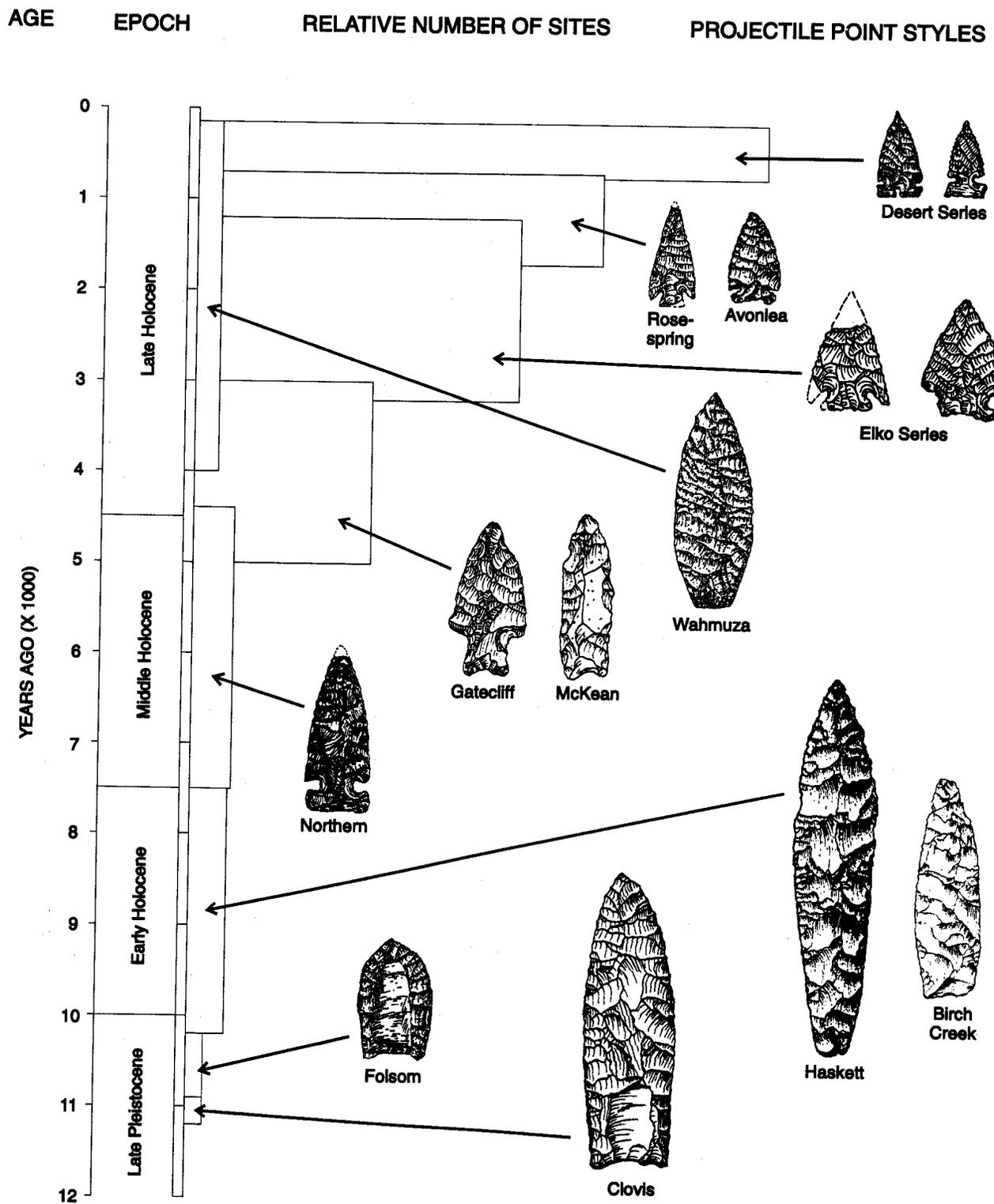


Figure 23. Cultural chronology of the eastern Snake River Plain. Width of bars in graph indicates temporal duration of projectile point styles; length of bars indicates relative number of sites associated with each style (from Holmer 1995).

The Nature of Prehistoric Evidence and the Hunter vs. Gatherer Debate

By its nature, archaeology is concerned with those materials from the past that persist. To become an artifact useful to archeologists, a thing must either be made of material that does not decompose or disintegrate, or it must be fossilized or otherwise preserved from the mechanical and chemical processes of wind and water. Cultural chronologies of prehistoric people (e.g., Figure 23) are based largely on inorganic material made of stone or clay (projectile points, grinding implements, pottery) and bone because those are the remnants of a people's material culture that survive to the present. Use of organic elements, such as plants, can usually only be inferred by assuming some measure of cultural continuity between the historic and the prehistoric. Such assumptions must then be examined in view of new information that may become available.

It is quite certain that from the earliest stages of human occupation on the Snake River Plain, people here were hunters of large game. Lithic tools from the earliest strata of cultural deposition include large spear points that are often associated with the bones of now extinct mammoth, caribou, bison, and horse (Reed et al. 1987:82-108). Grinding implements and pottery, which might indicate the use of plants, are almost entirely absent. The archaeological record indicates a gradual reduction in projectile point size that corresponds roughly with the local or complete extinction of large, relatively slow moving mammals, and their replacement by the swifter-footed, smaller mammals that exist on or about the INEL today: mountain sheep, deer, elk, and pronghorn. The smaller projectile points are accompanied first by evidence of spear-throwing technology (i.e. the atlatl), and later by evidence of the bow and arrow, both of which seem to be adaptations to the hunting of smaller, faster animals (Ringe 1995).

Use of plants by prehistoric people is only infrequently indicated by the archaeological record. Seeds may be found charred in a hearth or adhering to the inside walls of a cooking pot. They may also be found preserved as they were cached in a sealed container buried for future use. Coprolites, or human feces, are one of the most valuable sources of information about the prehistoric human diet, as indigestible parts of both plant and animal food may be preserved there. Remnants of wood and brush shelters may be found preserved in very dry climates, or roof support post holes may be discerned from a sub-

surface change in soil structure and the presence of molds (from decomposing posts) in the soil. The problem for archaeologists on the Snake River Plain is that such examples of preserved organic materials are seldom found in this part of the world. Here, the combination of semi-arid (as opposed to arid) conditions with semi- to fully-nomadic cultures produced an archaeological record that is heavily biased toward the more recalcitrant artifacts: lithic tools and evidence of their manufacture, and the bones of animals brought down by their use. This evidence alone would lead one to believe that the Plain's prehistoric inhabitants were subsisting chiefly on flesh.

However, one of the INEL's best preserved sites, Aviator Cave (Figure 22) presents a limited cultural assemblage that provides evidence to the contrary. It includes charred cactus seeds and spines, twined plant fiber, both matted and charred sagebrush, a bunchgrass torn up by the roots and apparently used as a makeshift broom (the stems are evenly worn), and a few fragments of Subalpine Fir needles that must have been transported to the site (perhaps stuck in sap carried as travel food). This site dates to between 1500-300 B.P. (Lohse 1990), and its cultural assemblage can be readily interpreted despite sketchy ethnographic information: cactus stems and fruits were eaten, often after being roasted in a fire; sagebrush was often used for fuel, insulation, or bedding; various kinds of sap were collected and eaten, or carried about as travel food (Steward 1938). Unfortunately, this is one of only a handful of sites on the eastern Snake River Plain containing any ethnobotanical information at all. Consequently, most of what we can say about prehistoric plant use in this region is conjecture based on ethnographic information, on assumptions of prehistoric-historic cultural continuity, and on models of human nutrition. However, studies of successful hunter/gatherers worldwide suggest that the common pattern is one of primary reliance on plant resources as *the* dependable source of calories (Lee 1968, Simms 1984).

Ethnoecology of the Plain

It is generally agreed that the aboriginal culture areas of the Great Basin were defined by the ranges of two plants: greasewood in the south and sagebrush in the north. That observation underlines the ecological nature of ethnobotanical lore but fails to illuminate the diversity of environments available to the region's indigenous people. That Shoshone/Bannock ethnoecology emphasizes riparian communities is indicated by prehistoric evidence and his-

toric accounts of long-term camp sites along rivers, as well as by the relatively large body of customary knowledge concerning water-related resources (Lowie 1908, Steward 1938, Clark 1986). However, indigenous ecological knowledge is by no means limited to riparian ecosystems any more than it is to sagebrush-dominated plant communities. The semi-nomadic nature of Shoshone/Bannock subsistence in the past, and the practice among some members of the present day Reservation population of gathering seasonally available resources from far afield (e.g. pinyon nuts and bitterroot, neither of which grows on or near the Fort Hall Reservation) imply a breadth of Shoshone/Bannock ecological knowledge that is in keeping with the region's environmental diversity.

Ethnography as well as archaeological evidence has revealed that the prehistoric populations using resources on the INEL were nearly as transitory as the populations active there in recorded history. The few sites with any cultural stratigraphy (most sites are surface scatters of lithic debitage), such as Aviator Cave, are interpreted as short-term camp sites used successively over perhaps a number of years (Lohse 1990, Henrickson 1991). However, recent studies of site distribution on the INEL (Ringe 1995, Reed et al. 1987) imply that prehistoric population movements were aimed at landforms that were indicative of certain resource communities. One such study associates prehistoric evidence of human activity on the INEL with specific topography, such as buttes, craters, caves, the Big Lost River, Birch Creek, the Lemhi mountains, edges of lava flows, and the Lake Terreton basin (Ringe 1995). The Lost River Sinks are also considered areas of high site potential, although relatively few archaeological sites have been recorded there. This dearth of recorded sites may be due to the small number of archaeological surveys performed there and to lacustrine and alluvial soil deposition that may have rapidly covered any sites that did exist (Ringe 1995). Such sites may have been preserved, however, and further survey of the Sinks area may reveal areas where wetland plant species such as cattail were processed.

Reed et al. (1987:111-114) list five landscape types postulated by archaeologists to have affected the movements and ecology of early human populations: the Great Rift, which may have served to divert human transit around recent lava flows (there are high site concentrations along lava flow margins); buttes, which served as vantage points and held lithic resources (e.g., ignimbrite), wood, and, on some, permanent water; dunes, which offered wind

protection and soft bedding (most archaeological sites associated with dunes are located in the lee of pressure ridges); lava tubes, which offered shelter and water both historically and in prehistory; riparian areas such as those mentioned above; and playas offering seasonal water-related resources.

Historic Human Occupation: Linking the Past with the Present

Resources of the eastern Snake River Plain were relatively abundant by western Plain and Great Basin standards. Early explorers interpreted the state of the Great Basin's native human population as one of abject poverty. Writing from Fort Hall to Henry Schoolcraft at the Office of Indian Affairs on April 3, 1848, Wyeth recounts,

...the few whites in the region called the more miserable bands Diggers, or Shoshonees [sic]. They differ from the other Snakes [the English term for Shoshones] somewhat chiefly in language; their condition is much poorer, having no horses and living chiefly on fish and roots from the brooks with what small game that region affords (Schoolcraft 1851:206).

It was not until the printing of anthropologist Julian Steward's (1938) landmark work, *Basin-Plateau Aboriginal Sociopolitical Groups*, that more detailed ethnographic information came to light. Except for the records of Lewis and Clark and of anthropologist Robert Lowie (1909), interpretations of subsistence and social activities of the region's aboriginal inhabitants are largely inaccurate, confusing, exaggerated, or made in passing since most Euroamerican visitors to the Snake River Plain during the early historic period were intent only on reaching Oregon and the coast. As Steward lamented,

Despite the large number of travelers, which included many ambitious chroniclers, records of the Indians continue to be disappointing. The natives between the Rocky Mountains and the Sierra Nevada Mountains were generally dismissed with the remark that they were only miserable "Diggers" (Steward 1938:6).

However, Steward's ethnography includes and either corrects or augments the observations of many early travelers, well-known and obscure alike. His lengthy ethnographic descriptions were obtained from some of the last Shoshone and Bannock whose memories

included pre-reservation life. He made significant contributions to Basin-Plateau ethnology by paying special attention to the intense interplay between culture and environment. This he defined not as “environmental determinism” which “postulates some kind of automatic and inevitable effect of environment upon culture” but as “human ecology or the modes of behavior by which human beings adapt themselves to their environment” (Steward 1938:2).

Steward’s ethnographic work has not gone unchallenged, but it is still considered the baseline for most anthropological research in the Great Basin-Plateau region. Most of what is known of Snake River Plain ethnology stems from Steward’s work, but it is continually supplemented by more recent findings of archaeology.

Steward’s Interpretation of Shoshone/Bannock Subsistence

Although the eastern Snake River Plain was not considered a place of abode except along major waterways, it was flanked by people who made good use of its resources. The Lemhi and Tukaduka (mountain sheep eater) Shoshone lived in and around the Lemhi Valley, and the Fort Hall Shoshone and Bannock³, though more nomadic than the Lemhi groups, wintered along the Fort Hall bottoms on the Snake River. In spring and summer, both groups are said to have broken into small, socially fluid groups composed of a few to several related families (smaller groups could more easily feed themselves while moving from resource to resource). Every year, a group’s composition might change, and families often alter-

³The Shoshone and Bannock of the Fort Hall area, historically and to some extent prehistorically, wintered together in the vicinity of Fort Hall. They often joined forces with each other and with other Shoshone in hunting, gathering, trading, and defending themselves against the Blackfoot and Crow. Although they were socio-politically similar, they were and are linguistically distinct groups: the Shoshone language is more closely related to Ute and Gosiute; Bannock stems from Northern Paiute. However, both are Numic languages, whose stock was originally found in southern California and subsequently spread east and north in a much debated phenomenon known among anthropologists as the “Numic Expansion.”

nated between various yearly subsistence activities: one summer might be spent collecting roots and trading with the Nez Perce, Flathead, and other Shoshone on the Camas Prairie of the western Snake River Plain; the next summer might be spent to the east, collecting berries, nuts and roots on the way to and from bison hunts in Yellowstone or on the northern plains. Salmon could be obtained to the west on the Snake River below Shoshone Falls. Berries and game were plentiful to the south around Bear River (Figure 24). Steward recounted:

Whether they went east for buffalo, south...for berries and for hunting, or west for salmon, camass [sic], and trading depended upon individual circumstances. Also, whether they joined other groups depended upon where and when they traveled and whether they had horses (Steward 1938:203).

Very little is known about the culture and subsistence of pre-horse aboriginal groups in this area. Steward (1938) and others have surmised that the Northern Shoshone culture of the pre-horse era (most of their history) would have been similar to, though more nomadic than, that of the Western Shoshone of the western Snake River Plain and eastern Oregon in the historic era, for these people remained unmounted even after their eastern relatives chose the equestrian lifestyle. Bannock and Northern Shoshone groups (including both Lemhi and Fort Hall Shoshone) had horses by the early 1700’s (Murphy and Murphy 1960). It is not clear whether acquisition of the horse radically changed subsistence activities, but it seems that it significantly altered social structures especially among those groups that traveled east for bison. Whereas the family and small group were the most efficient economic units throughout the Great Basin, larger group solidarity and cooperation were necessary features of a successful bison hunt, and were in turn made possible by the increased wealth (measured chiefly in horses and bison robes) and the ensuing need to protect that wealth from enemy groups.

Shoshone cultural distinctiveness at the east and west ends of the Snake River Plain, especially in terms of subsistence strategies, was the result of environmental differences. The Snake River Plain becomes less and less arid as one travels west to east. Prior to 1840, bison were found chiefly in the northeastern portion of the Plain and hardly at all toward the west, owing primarily to a lack of feed (Steward 1938). Likewise, horses that were acquired by those

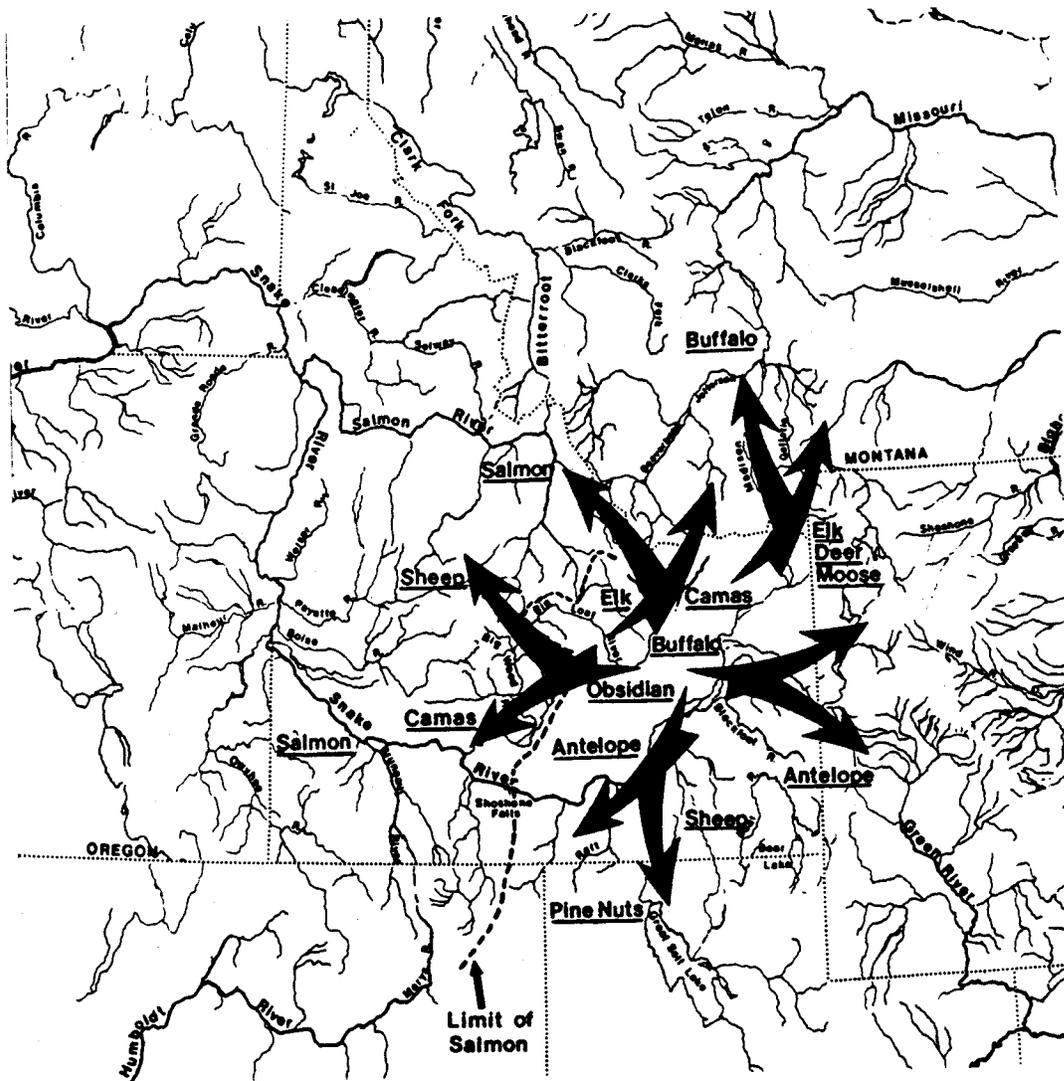


Figure 24. Subsistence resources of the eastern Snake River Plain (from Reed et al. 1987).

living on the western Plain tended to eat “the very plants upon which people depended” and so were usually eaten themselves rather than used in further quests for food (Steward 1938). In contrast, the horse must have fit easily into the already nomadic lifestyle of the Northern Shoshone, whose access to bison was only limited by speed and the element of surprise. Here, the horse provided a mode by which human beings could better adapt themselves to their environment, thus increasing their ability to exploit its myriad resources. In the Lemhi Valley, on the northeastern Snake River Plain, on the Fort Hall bottoms, and all along the upper Snake River, there was plenty of grass to support an expanding equestrian lifestyle.. On the eastern Plain, human and horse

ecologies were compatible, whereas on the western Plain, they were not (Steward 1938:230-237).

The Contact Period

By the time Euroamericans started keeping historical accounts of the aboriginal ways of life they were displacing, those lifestyles had been adapting to the stresses placed on them by populations to the east for decades. For millennia, a very low population density and a nomadic lifestyle had allowed the Northern Shoshone and Bannock of the Snake River Plain to exist in relative harmony with neighboring Basin and Plateau cultures. The Great Plains cultures to the east posed periodic threats as Blackfeet and

(less commonly) Crow bands came west of the Rockies to steal horses. But the more significant threat came when, sometime around 1750, the Blackfeet acquired firearms from the Europeans. When Lewis and Clark arrived in the Lemhi Valley in 1805, the Shoshone of that area had already been driven back from their earlier expansion into the northern Great Plains by a combination of mounted, well-armed Blackfeet, and the ravages of smallpox (Murphy and Murphy 1960:295), in other words, by the ripple effects that preceded Euroamerican expansion. By the time Lewis and Clark reached them, the Northern Shoshone had possessed horses for over a century, but they had ceased making forays into the northern Great Plains for bison except when joined by Flathead, Bannock and other Shoshone to increase their own defenses. The bison they had hunted even on the Snake River Plain were infrequently pursued anymore for fear of raiding, well-armed Blackfeet (Lewis and Clark in Steward 1938:192). Although bison were still numerous on the Snake River Plain in 1834 when Nathaniel Wyeth built the original Fort Hall,

Hall, they began to decline soon after that, hastened by the increasing numbers of Euroamerican trappers and explorers entering and exploiting the lands west of the Rockies. Wyeth noted in a letter to Schoolcraft, "Near Fort Hall, in 1834, there were plenty of buffalo, but soon after the Fort was established they disappeared from its neighborhood. The beaver disappeared next" (Schoolcraft 1851:217).

With the opening of the American Frontier came forces that would utterly disrupt the human ecology that had been developing along the Snake River Plain for thousands of years. The fur trade began in about 1810. By 1840 it had essentially come to an end, but the intervening years had seen a steady decline in game (including small mammals and birds) traditionally hunted by native human populations (Steward 1938). The Oregon Trail was well established by the 1840's, enabling the passage through southern Idaho of an estimated 240,000 emigrants and their 1.5 million grazing animals by the year 1857 (Madsen 1980). Native plant communities suffered massive overgrazing and trampling as a result, further depleting the resources on which Northern Shoshones, Bannocks and their livestock traditionally depended. By 1868, treaties had been signed forcing the native populations onto the reservation at Fort Hall; for a time, a reservation in the Lemhi Valley was established, but that group too was moved to Fort Hall, in 1907. By the 1870's, miners had entered the Salmon River country, providing the impetus for farmers, ranchers, and others to follow. And even though treaty provisions allowed for seasonal subsistence rights to traditional resource areas, such as the Camas Prairie, "native plants had been so reduced by cattle grazing and native animals by hunting that complete reliance on them was no longer possible" (Steward 1938:249).

The eastern Snake River plain contained enough resources, if one knew where to find them, to allow passage across it, and it offered seasonal usage of some choice areas (e.g. the Sinks and the buttes). Prehistoric and early historic humans were attracted to it for a wide variety of reasons ranging from bison to obsidian. In contrast, the first Europeans were largely repelled by what appeared to their agriculture-accustomed eyes to be a wasteland: "[These lands] are unfeasible for any kind of cultivation . . . from the extreme

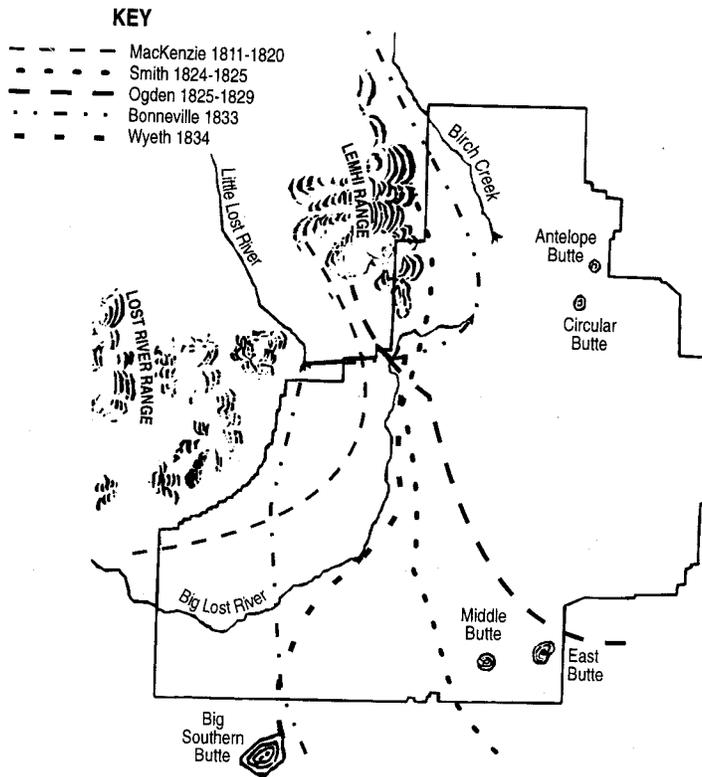


Figure 25. Approximate routes of trappers and explorers across the Idaho National Engineering Laboratory (redrawn from Reed et al. 1987).

coldness of the nights . . . superadded to extreme dryness and poverty of soil” (Wyeth in Schoolcraft 1847:210). Or, they were simply in search of something besides what the desert had to offer. Trappers and fur traders were some of the first to make their way across the Plain, probably following trails blazed and long-used by the Shoshone and Bannock. Figure 25 shows the probable routes they followed, cutting directly across the INEL and sticking close to sources of water wherever possible. Emigrants employed the part-Indian Tim Goodale and other guides to usher them across the Plain on an offshoot of the Oregon Trail that came to be known as Goodale’s Cutoff (Figure 26). The only travelers that settled prior to the 1860’s were Mormon farmers sent by Brigham Young to colonize the region. In 1855, they were digging irrigation canals and successfully homesteading to the northeast of the INEL (Clements n.d.). Meanwhile, stockmen made mad dashes across the Plain and wrote about their desert crossings in nightmarish terms:

Few of us will forget the torture of those two days and nights from Lost River to Blackfoot. It was through lava-ash and lava-dust country, covered mostly with sagebrush, where the lava was not on the surface to prevent brush from growing. It was by far the hottest weather we had experienced, and a blistering, dry, scorching wind blew out of the southeast . . . There were a few small depressions where a little brackish rain water had collected, but this was only an aggravation to our suffering animals. Every steer’s tongue hung out, and there was a hopeless expression in their faces . . . (Rollinson 1948:96-97).

Archaeological remains of historic livestock drives are embodied in the numerous roads and trails still evident on the INEL (Figures 26 and 27), and in the occasional basalt structures typical of early sheepherders. Livestock production was a commercial industry along the Snake River Plain by the late 1860’s, but its purpose remained a transient one as cattle and sheep were trailed between the coastal states and the grasslands east of the Rockies. It was not until the 1880’s that the livestock industry took root in the area (Wentworth 1948). Homesteads

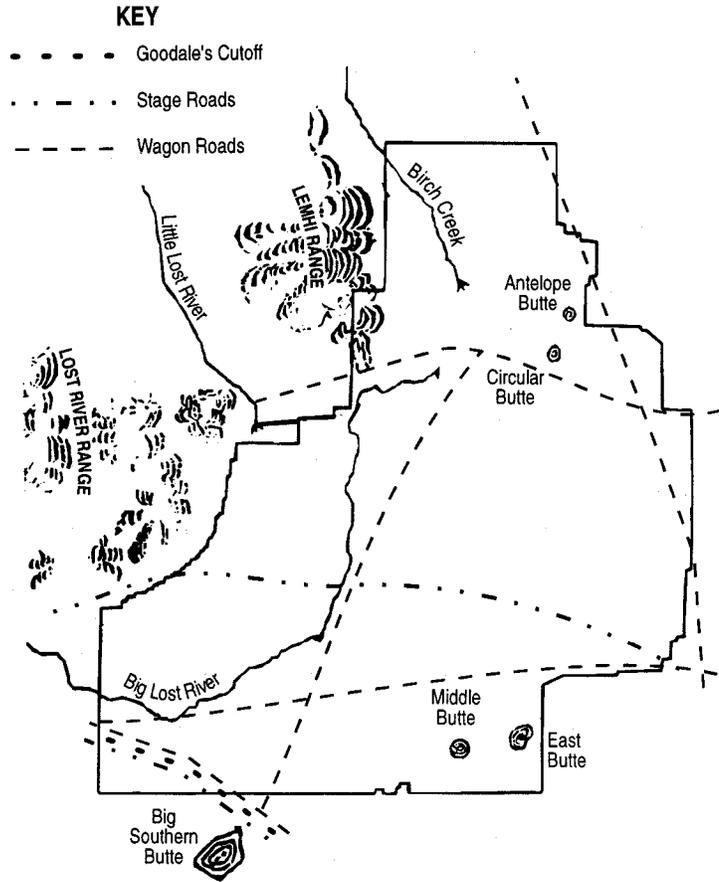


Figure 26. Emigrant, stage, and wagon roads at the Idaho National Engineering Laboratory in the mid 1800’s (redrawn from Reed et al. 1987).

sprang up along the Lost Rivers and Birch Creek. The Wood Livestock Company in the Pahsimeroi Valley and the Hawley brothers in the Little Lost Valley were two of the first to successfully import cattle and sheep. These were sold first to local miners and later to markets in Wyoming and Montana (Reed et al. 1987, Wentworth 1948). Commercial hunters also sold their goods to miners, but, by the early 1900’s, were finding themselves beat out by the livestock industry. Market hunter James Beard remembered, in 1903 or 1904, seeing the Little Lost after many thousand head of sheep had been driven up the valley to feed in the high country. After the sheep went through, there was no feed left to speak of for any other animal, wild or domestic (Robert Sherwood, Nevada BLM, personal communication, 1994). Domestic animals were usually wintered on the open range of the Plain, where snows were not so deep; then sheep were trailed into the valleys, and cattle into the foothills, following the receding snow

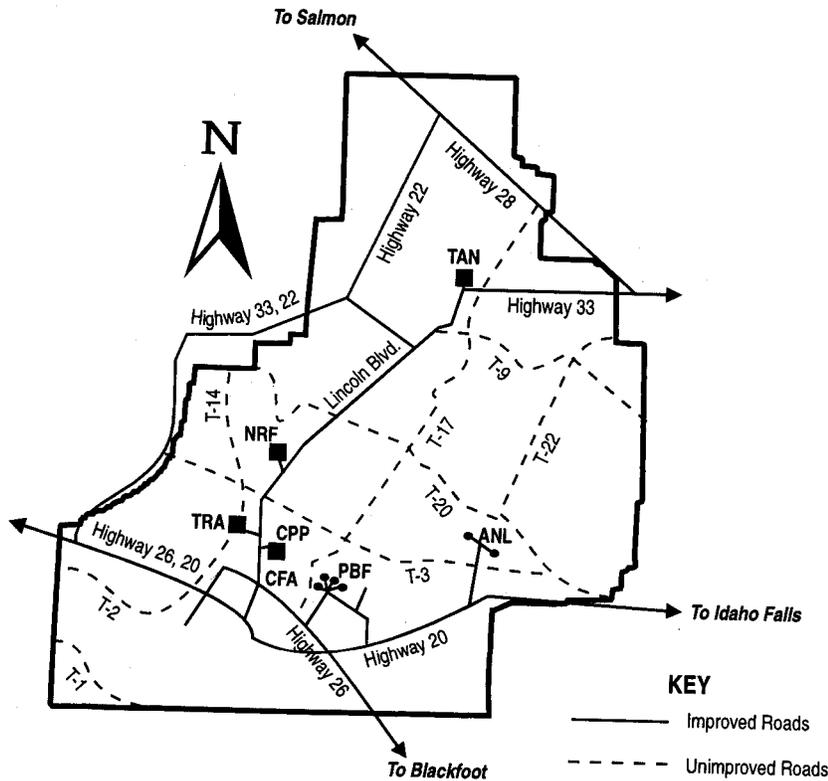


Figure 27. Unimproved roads currently designated as “t-roads” at the Idaho National Engineering Laboratory that were used for cattle and sheep drives or for stage and wagon travel (redrawn from Reed et al. 1987).

line through the warmer months. Wild horses also grazed on the Plain and in the Lost River and Birch Creek Valleys, their populations numbering between seven and nine thousand in the early 1900’s (Oberg 1970:134).

Real incentive to attempt settlement on the eastern Snake River Plain came with Federal Legislation. The Homestead Act of 1862 gave 160 acres to settlers willing to cultivate and reside on their newly acquired property for five consecutive years. The Desert Claim Act of 1877 provided 640 acres to settlers able to irrigate that land. In the Carey Act of 1894, Idaho obtained one million acres of Federal land for homesteading, with the proviso that the state would supervise its irrigation. And in 1902, Idaho received funding through the Reclamation Act to build diversionary canals in an attempt to “reclaim arid lands” (Reed et al. 1987). Of the hundreds of kilometers of major canals and distribution laterals that were dug within the first three decades of the century, only one system, the Owsley Canal (part of the Mud Lake project) in the INEL’s northeast corner, was successful, but only partially so (Figure 28).

Among the other attempts at making the desert bloom, the Carey Act’s Powell reclamation project was notable and notorious. During the first decade of the project, a diversionary dam on the Big Lost River and nearly 160 km of canals and laterals were constructed by Powell Tract settlers to supply water from a proposed reservoir above Mackay⁴, in the Lost River Valley, to the proposed village of Powell (also known as Pioneer) in what is now the INEL’s southwest corner. The next decade and a half were spent revamping the project until its final demise in 1927. The canals, the larger of which were “70 feet wide at the top, 40 feet wide at the bottom and 8 feet deep”, never held water (Reed et al. 1987, Schmalz 1963, Arco Advertiser 9/10/1909). A similar project with the same fate was attempted on the Little Lost River, with portions of canals extending across the INEL’s northwest boundary (Idaho State Journal 5/15/1989). The ruins of homesteads along the Big Lost River and foundations near abandoned canals are all that remain of these strenuous efforts to “reclaim” the desert.

During the Second World War, the Navy and the Army Air Corps used several hundred square kilometers of the eastern Snake River Plain as a gunnery range (Figure 29). In 1949, the Federal government coupled these ranges with a large parcel of land withdrawn from the public domain and some purchased private lands to form what was called the National Reactor Testing Station. Livestock grazing on the newly established “Site” (as it has come to be known by modern residents of the area) was disallowed until drought forced the issue in the 1950’s (Robert Sherwood, Nevada BLM, personal communication, 1994). Now, domestic grazing is allowed on about 60% of the INEL, including much of the

⁴ The dam above the present town of Mackay was finally completed in 1919.



Figure 28. An abandoned portion of the Owsley Canal near Road T-9 (see Figure 27) on the eastern side of the Idaho National Engineering Laboratory. Remnants of the abandoned sections of this canal system are visible on the satellite image (back cover) superimposed over the linear sand dunes on the northeastern side of the INEL.

area north of Highway 33 and elsewhere along the periphery.

Disruption of natural water flows⁵ and introduction of exotic plant species in those areas most heavily grazed (e.g. the Sinks) has severely degraded their historic plant diversity; for example, some of the wetlands communities that once thrived in the vicinity of the Sinks have been invaded and largely replaced by stands of Russian thistle (*Salsola kali*) and fanweed (*Thlaspi arvense*). In other areas, cheat-

⁵ By the 1800's, settlers had begun diverting water from the Lost Rivers and Birch Creek for irrigation. This lowered water levels in the Sinks, but the more drastic downstream effects of irrigation were not fully realized until sprinkling was instituted. The first "wheelines" in the Big Lost River Valley north of Arco appeared only within the last 12-15 years (H. Dorst, Mackay resident, personal communication, 1992). The ability to irrigate more acreage more effectively increased the amount of water taken from the river and from the underlying aquifer as more and more wells were drilled.

grass (*Bromus tectorum*) is the primary invader and, once established, becomes a perennial problem for both agriculturalists and for those interested in preserving the integrity of the Plain's most nearly natural habitat. Otherwise, large portions of natural sagebrush cold desert remain untouched by the surrounding drive for development. Herds of elk and pronghorn find refuge there, and it is one of the few areas left on the Snake River Plain that has not been wholly plowed under. In 1974, the Site was given its current name, the Idaho National Engineering Laboratory, to emphasize that its mission has changed over the years to include aspects of scientific inquiry besides nuclear research and testing. Designation of the INEL as a National Environmental Research Park in 1975 emphasized its importance as a field laboratory for ecological research and for studying the environmental impacts of energy development. Except for domestic grazing and the ongoing degradation of ground and surface water sources, much of the INEL is a microcosm of the eastern Snake River Plain that existed up until 150 years ago. It represents a unique opportunity for long-term scientific inquiry and preservation.

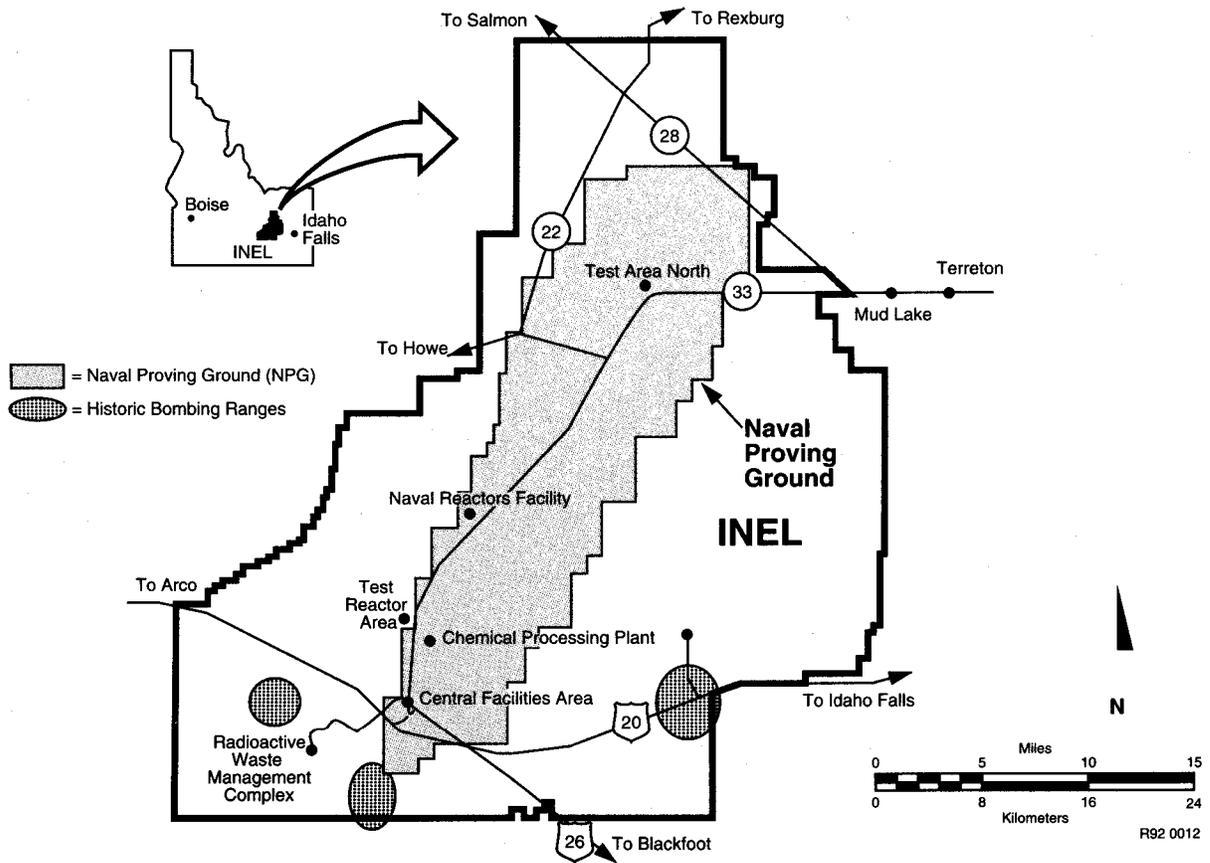


Figure 29. Locations of the U.S. Navy's artillery range and bombing ranges used during World War II at the Idaho National Engineering Laboratory (from Update Fact Sheet, INEL Environmental Restoration Program, March 1995.)

ETHNOBOTANY

The current status of documented ethnobotanical knowledge pertaining to plants found at the INEL is tabulated on the following pages. We endeavored to distinguish between generalized ethnobotanical information - that attributed to "the Indians," as if all indigenous groups could be represented by one cultural milieu - and specific ethnobotanical repertoire included in Shoshone/Bannock cultural ecology. The task of documenting a Shoshone/Bannock ethnobotany is ongoing and is largely a matter of reconstructing past behavior from lingering linguistic evidence and reporting present day practices from ethnographic research. The table shows the native Shoshone/Bannock term for the plant or plant parts, if it is known, and a symbol referring to the documented status concerning use of the plant by the area's native aboriginal population (see key below). These symbols do not represent Shoshone/Bannock use or non-use of a plant; instead, they represent the state of documentation concerning a plant's use. This distinction is meant to establish a baseline from which further research, more in the vein of reconstructive ethnography, might stem. It should also be noted

that many of the "food plants" listed in the table are exotic species that were introduced to the area after European settlement. These would have come into use by local Native Americans during the last two centuries.

Key to Symbols in Table

- + = documented use among indigenous groups of the eastern Snake River Plain
- ? = use inferred from documented use among neighboring groups
- = potential for use, but no documentation found
- ¹ denotes introduced species
- Initials "DG" and "RW" refer to key Shoshone and Bannock informants.