THESIS

CULTURALLY SPECIFIC INFORMATION IN WATER AND RIVER CORRIDOR MANAGEMENT: THE WIND RIVER INDIAN RESERVATION, WYOMING

Submitted by
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WE HEREBY RECOMMEND THAT THE THESIS PREPARED UNDER OUR SUPERVISION BY CATHLEEN M. FLANAGAN ENTITLED "CULTURALLY SPECIFIC INFORMATION IN WATER AND RIVER CORRIDOR MANAGEMENT: THE WIND RIVER INDIAN RESERVATION, WYOMING" BE ACCEPTED AS FULFILLING IN PART REQUIREMENTS FOR THE DEGREE OF MASTER OF SCIENCE.

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ABSTRACT OF THESIS

CULTURALLY SPECIFIC INFORMATION IN WATER AND RIVER CORRIDOR MANAGEMENT: THE WIND RIVER INDIAN RESERVATION, WYOMING

Knowledge is based on a set of assumptions about reality and the world that is dictated by environment, tradition and religion (Sterling, 1990). Indigenous people and their culturally specific knowledge associated with local ecosystems are being credited with bio-diversity protection around the world. As a result, environmental managers are acknowledging the long-range environmental benefits of indigenous approaches for managing natural resources. This recognition has catalyzed the inclusion of indigenous people in the development of sustainable resource management solutions, affording them a voice in nature conservation and resource management agendas in areas around the world. However, in the United States, Native Americans' cultural and ecological knowledge of local ecosystems has been overlooked in making resource management decisions. Although current research has explored the value and protection of indigenous knowledge, little effort has been focused on developing ways to integrate indigenous ecological knowledge with Euro-American scientific knowledge to obtain sustainable solutions to resource dilemmas.

This thesis concentrated on developing a conceptual model of Shoshone and Arapaho indigenous ecological knowledge associated with water and the riparian corridor. The research has shown that elements of the Shoshone and Arapaho indigenous knowledge systems that were incorporated in Tribal water law are not reflected in Wyoming water laws. The methodology applied in this thesis was developed into a procedural outline to determine whether indigenous ecological and cultural knowledge has been equitably integrated into Euro-American water management schemes. This procedure may provide a

concrete outline for applying these techniques to varying resource management questions within different indigenous cultures. The research shows that indigenous ecological knowledge and management practice associated with river corridor areas are related to the culturally significant perceptions and uses of biological and natural resources of the localized ecosystem.

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CHAPTER 1.0-INTRODUCTION

Cultural interaction with the landscape and indigenous land management techniques have been shown to effectively maintain the diversity of world ecosystems (Lalonde & Morin-Labatut, 1995; Huffman, 1992). Research focusing on indigenous knowledge and land management practices revealed that the diversity of indigenous resource use and management practices represents ecological knowledge and adaptive experiences spanning many millennia (Gadgil, et. al., 1991). Research has proven that indigenous management techniques based on cultural practices and knowledge are successful at maintaining functioning ecosystems (McNeely, 1993). Resource managers are acknowledging the idea that indigenous resource management adaptations often represent environmentally sound methods for conservation (McNeely, 1993).

Resource managers around the world are questioning whether Euro-American resource management techniques adequately constitute an effective model for managing resources in a sustainable fashion (Ruppert, 1996). A large body of research that focuses on varying approaches for integrating other knowledge systems and world-views with Euro-American scientific approaches exists (DeWalt, 1994; Sterling, 1990; Gadgil, et. al., 1991; Cashman, 1991; Clarke, 1990). Unfortunately, very little of this research presents models or procedures for effectively integrating elements of indigenous conservation and management practices into currently accepted resource management methodologies (Ruppert, 1996; Akimichi, 1978). Research focusing in this area is needed if elements of indigenous knowledge are to be utilized in the management of sustainable ecosystems. For these reasons, a case study focusing on culturally specific information associated with water and the river corridors was conducted on the Wind River Indian Reservation in Wyoming. Research efforts were aimed at developing a procedural model to expedite the inclusion of Shoshone and Arapaho culturally specific information into river corridor and water resources management.

1.1 WIND RIVER INDIAN RESERVATION CASE STUDY

Indigenous societies have been recognized for their role in protecting biological diversity through the application of culturally specific information. Because of this recognition, some indigenous societies have been included in the preservation and management of ecologically important land reserves around the world. Their inclusion in the management of these ecologically vital areas has shown that the culturally specific information, derived from indigenous knowledge systems, can provide critical information with regards to ecological and cultural resources, while providing an equal role for indigenous people in resource management (McNeely, 1993; Lalonde & Morin-Labatut, 1995; Davey, 1993). Despite this, Native American culturally specific information has not been utilized in resource management schemes in the United States (Ruppert, 1996; Pinkham, 1996; Huffman, 1992). Models for incorporating culturally specific information into resource management decisions are needed in order to provide Native American tribes and indigenous people around the world with equitable roles in resource management decisions.

Eastern Shoshone and Northern Arapaho ecological and cultural knowledge of water and the river corridors were collected to support the characterization of culturally specific information and research into indigenous resource management practice of the Wind River Indian Reservation. The results of this research will provide a procedural outline for presenting previously overlooked information and alternative management strategies for ecologically important areas, while establishing a voice for Native American in the arena of Euro-American resource management.

1.2 STUDY SITE-THE WIND RIVERS INDIAN RESERVATION

The Wind River Indian Reservation is located in northwest portion of Wyoming (Figure 1.1). It is home to the Eastern Shoshone and Northern Arapaho tribes. The reservation's 2,200,000 acres are located in Freemont and Hot Springs Counties. It was established through an amendment to the Fort Bridger Treaty (1863). The treaty was enacted between the Eastern Shoshone Tribe and the US Federal Government in 1868. The Northern Arapaho Tribe was granted the right to occupy the reservation in 1878 and was eventually given joint ownership of the tribal lands (Checchio and Colby, 1993). The sovereign governments of the two Tribes jointly manage the reservation resources. This management is conducted

through the Shoshone and Arapaho Business Councils, and the Joint Tribal Council of the Shoshone and Arapaho Tribes.

1.2.1 THE WIND RIVER BASIN

The Reservation lies within the Wind River Basin and is home to the mountains from which the headwaters of the Wind River flow (Figure 1.2). The Wind River Basin is a crescent-shaped valley approximately 130 miles long and 70 miles wide, which is part of the greater Missouri River Basin. It is bounded on the west and southwest by the Wind River Mountains and on the north by Owl Creek and the Copper Mountains. The headwaters of the Wind River resides within Reservation lands and stems from the northeastern slope of the Wind River Mountains (Figure 1.3). The Big Wind river flows southeast. It unites with the Popo Agie River and bisects the reservation before the confluence with the Big Horn River. The Big Horn River continues flowing North before joining the Yellowstone River in Montana.

The Wind River's estimated average annual runoff is 897,900 acre-feet based on a period 57-year period, from 1940 to 1999 (USGS Web Site, 1999). Precipitation in the Wind River Basin averages approximately 9 inches annually, with the majority of runoff resulting from alpine snowmelt (USGS Web Site, 1999). The tribes consider the Wind River to be sacred and view it as the reservation's most valuable natural resource.

1.2.2 SOCIAL AND ECONOMIC STATE OF THE WIND RIVER RESERVATION

The economy of the Wind River Basin is dominated by agriculture and ranching and the landscape is rich in mineral resources. The town of Riverton and the Riverton Reclamation Project, operated and maintained by the Midvale Irrigation District, support the agricultural and ranching economy of the basin. Riverton, the Riverton Reclamation Project, and the Midvale Irrigation District are located within the reservation and controlled by non-Native American interests. In addition to the natural resources that sustain the economy of the basin, the basin is a popular retreat for recreationalists.

There are approximately 258,490 acres of timber, of which 99.6% is considered commercial timberlands, and 1,612,000 acres of rangeland, some of which are the finest grazing land in Wyoming (Eastern Shoshone Tribe, 1998). Elevations on the Reservation range from a low of 4,500 feet to a height

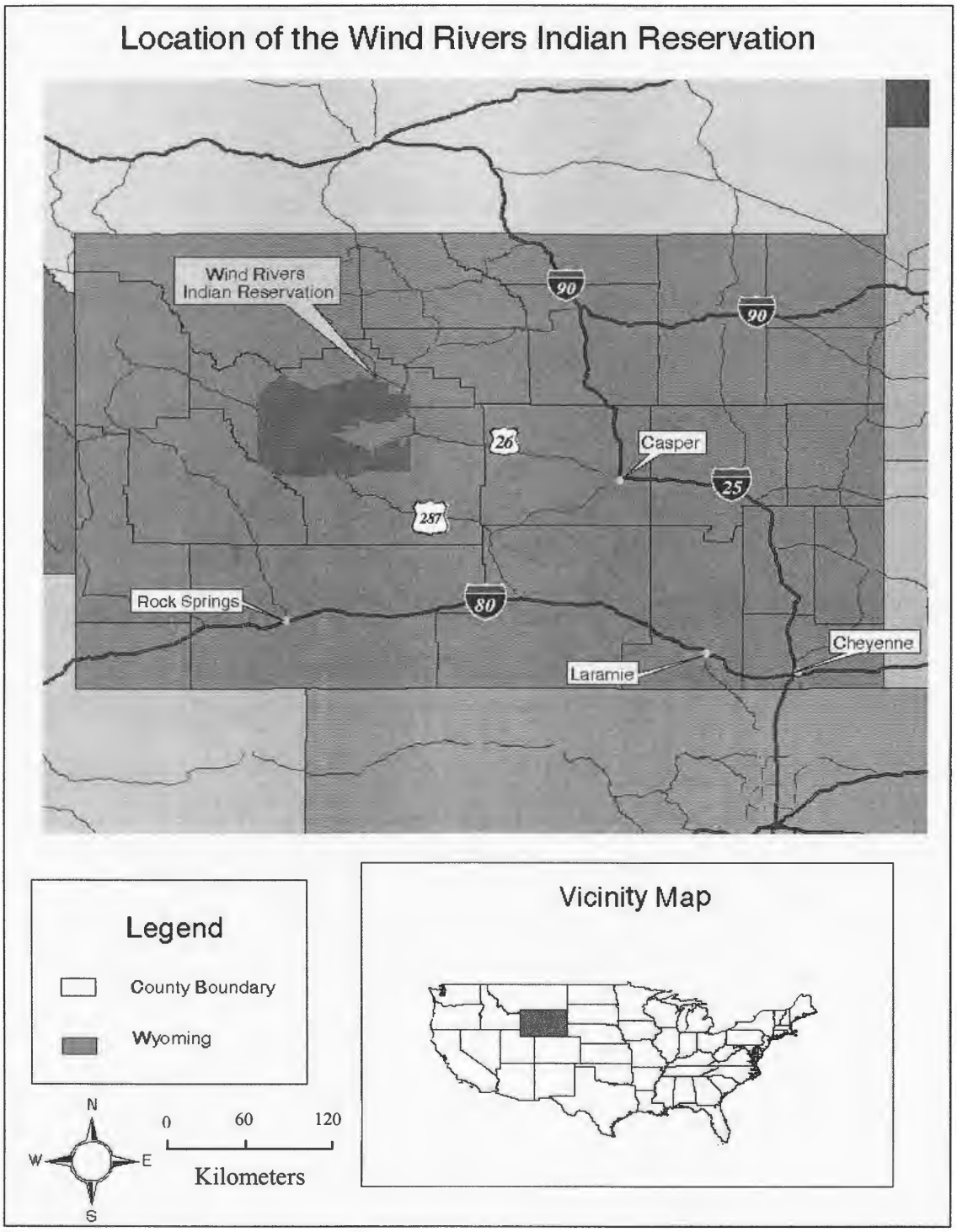

Fig. 1.1. Wind River Reservation Vicinity Map

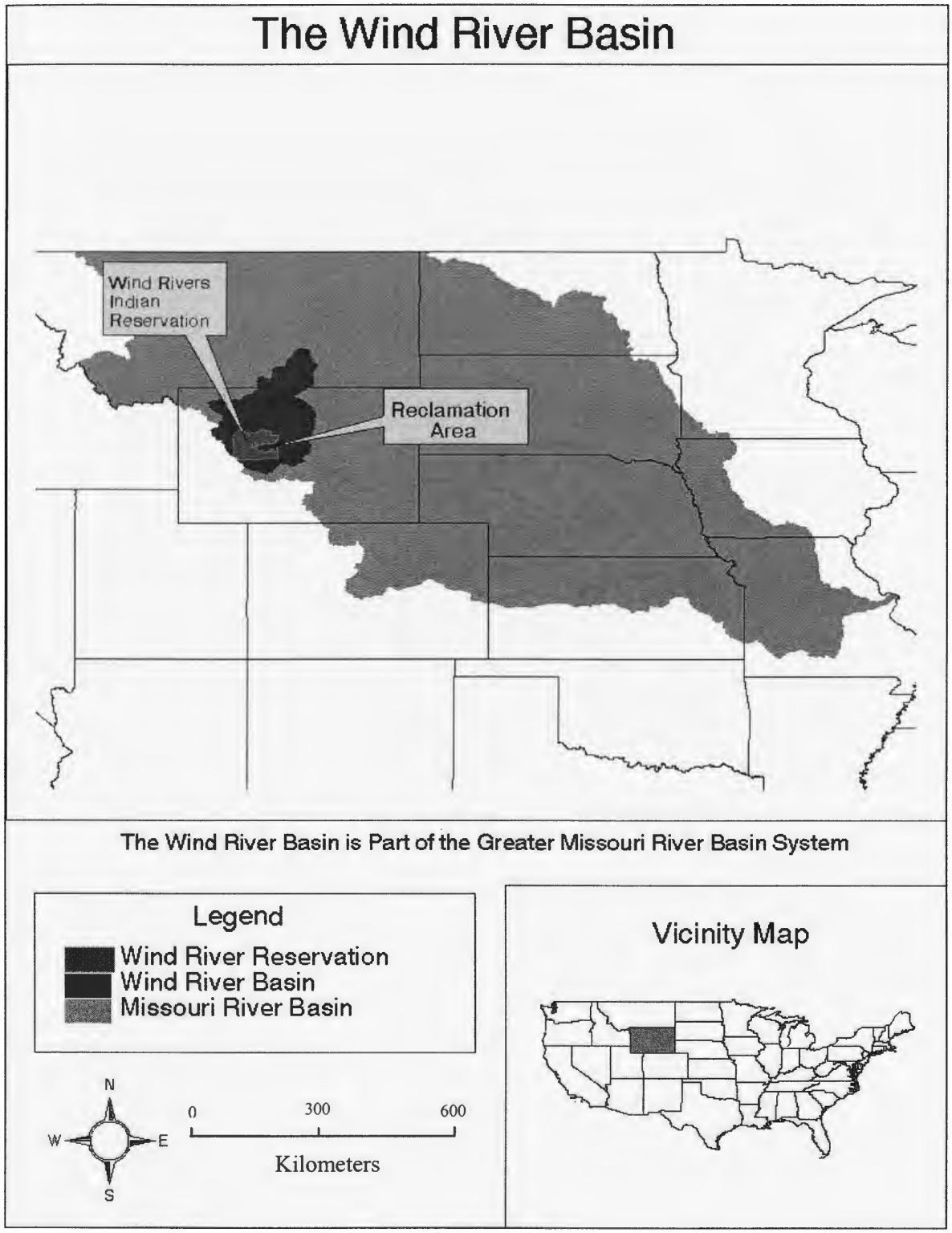

Fig. 1.2. Map of the Wind River Basin and the Reservations Location

Fig. 1.3. The Headwaters of the Wind River within the Wind River Mountains

of over 13,000 feet in the Wind River Mountains (Figure 1.4). There are approximately a million acres of mineral land, consisting of silver, oil, and natural gas (Checchio and Colby, 1993).

Despite the rich natural resource base of the reservation, the economic status of the Tribes is poor. Subsistence agriculture and ranching continues to support the needs of many tribal people. Non-agricultural employment in the Wind River Basin usually consists of low-skill jobs, school and government employment, and seasonal construction in oil fields. Tribal income is primarily derived from mineral severance taxes, fishing license sales, and the lease of rangeland for livestock grazing. The economy of the reservation is affected by many factors, including the Midvale Irrigation District. It is important to discuss why the presence of the Riverton Reclamation project within the Reservation did not benefit the economic state of the Wind River Tribes.

The Effect of the Riverton Reclamation Project on Tribal Water and Life

The history of the Wind River Reservation's land and water right holdings has been influenced by the Federal Government through the construction and operation of the Riverton Reclamation Project. The operation of the reclamation project within the Reservation has affected the ability of the Wind River Tribes to manage reservation water resources according to their Tribal ethics and water code.

Fig. 1.4. The Diverse Terrain of the Wind River Reservation:
A view of the Wind River Mountains seen from the plains.

The Riverton Reclamation project was established by the Bureau of Reclamation in 1918. The project features include Bull Lake Dam and reservoir, Pilot Butte Dam and reservoir, Wind River Diversion Dam and reservoir, and Pilot Butte Powerplant, together with approximately 100 miles of main canals, 300 miles of laterals, and 335 miles of drains (Bureau of Reclamation , 1999). The project was constructed on the reservation lands that were declared to be "held in excess" by Indian people, according to the McLaughlin Agreement (ratified by Congress in 1905). The McLaughlin Agreement specified a finite acreage of land that could be allotted to individual Tribal members and declared all lands exceeding that sum to be in excess of the total acreage legally available for Tribal people. A total of 332,000 acres of reservation lands were withdrawn from the Shoshone and Arapaho Tribes under Reclamation laws, thereby reserving the lands for the Riverton project. In order to form the Riverton Reclamation project in 1906, the government offered 1,480,000 acres of Reservation lands for sale under the Homestead Act. $3,650,000 of Federal funding was guaranteed for the construction and development of the project for a period through 1926.

The success of the project is arguable. At the onset of the project, the Wyoming State Engineers Office estimated that 265,000 acres along the Wind River, and within the original boundaries of the

reservation, could be watered by the Riverton project. Once the project was completed only 53,000 acres of homesteaded land holdings were actually irrigated by the project. In 1921, portions of the Reclamation Project within the reservation were returned to Indian jurisdiction. The Tribes were compensated at $1.50 per acre for some 100, 000 acres of reserved land that had been opened and lost to homestead entry. Other than this payment, the Tribes have not received compensation or benefits from the Riverton Irrigation Project, which exists on the most agriculturally productive lands within the original Reservation boundaries (Checchio and Colby, 1993).

The project alters the hydrologic behavior of the Wind River and affects Tribal use of water within the Reservation. The water supply is derived from the Wind River and its tributaries, which originate on Reservation lands. Water released from Bull Lake Reservoir, which is also located within the reservation boundary and is the main water storage entity of the project, flows through Bull Lake Creek to the Wind River, augmenting its flow. The effects of releases from Bull Lake Dam on the ecological health of the lower reaches of the Wind River have prompted numerous studies by the WY Division of Fish and Wildlife (1990) and the University of WY (1993). Both studies have documented the destruction of the stream channel and the loss of fish species associated with increased flows and sediment loads in the lower reaches of the Wind River. Unfortunately, the results of this research have not resulted in any action by the Bureau of Reclamation to protect Tribal interests. As a result, the Wind River Tribes have been unable to protect the ecological health and blue ribbon trout habitat of a reach of the Wind River that attracts large numbers of tourists and is a Tribal resource for subsistence fishing. The fight for the rights of the Wind River Tribes to control their Indian Reserved Water Rights according to their cultural, social, and economic beliefs continues. This struggle is exemplified by the Tribes court battle to protect instream flows in the Wind River through the application of their reserved Indian water rights.

WATER RIGHTS

On July 3, 1989, the United State Supreme Court upheld the Wyoming Supreme Court decision to award the Shoshone and Arapaho tribe a reserved Indian water right of 500, 717 acre-feet with a priority date of 1868 (Checchio and Colby, 1993). Until this point in time, the state of Wyoming has applied the Prior Appropriation Doctrine (1872) to establish Native American and non-Indian water rights in the Wind

River Basin. According to the Prior Appropriation Doctrine, water rights are awarded to individuals on a first-come, first serve basis. Under the doctrine, the volume of water available to private landowners is determined through the assessment of annual water yields in the Wind River Basin. The doctrine applies a "use it or lose it" approach to the management of water rights, whereby a water right is lost if the complete volume of allotted water is not applied to its dedicated purpose. Because reserved Indian water rights are not subject to the "use it or lose it" criteria applied to traditional Prior Appropriation water rights, the Tribes maintain the awarded volume of 500,717 acre-feet of water as their water right, whether they apply it or not (Checchio and Colby, 1993). This means that the Tribes have a water right reserved through time, for future use. Water rights in the Wind River Basin are over appropriated if the Wind River Reservations reserved Indian water rights are considered, and non-Indian rights are dependent upon unused Indian water to satisfy their rights (Checchio and Colby, 1993). As a result of this over appropriation, Midvale Irrigation District water right holders fear their agricultural and ranching livelihoods could be lost to the Tribes eventual use of Tribal water (Aragon, 1998).

Despite the Tribes ownership of 500,717 acre-feet of reserved Indian water rights, all water resources in the Basin are administered by the State Water Engineer. The Tribes ability to apply their reserved Indian water rights is limited by the State Engineer who dictates the flow of Tribal water to non-Indian water right holders in the Midvale irrigation district. The Tribes must submit requests for the application of reserved Indian water rights to the State Water Engineer. In turn, the State Engineer determines whether the applicability of that right is allowable under Federal and state water statutes. This chain of events (request and use) disregards the Tribes sovereign right to manage their water resources according to the Wind River Reservation Water Code (1991).

The over allocation and the conflicting interests for surface water within the Wind River Basin make it difficult for the Wind River Tribes to apply water to culturally determined uses. In other words, the need for water to support the agricultural and ranching economy of the Wind River Basin conflicts with the application of reserved Indian water rights to the culturally defined uses of the Wind River Tribes.

1.3 THE RELATIONSHIP BETWEEN WATER AND KNOWLEDGE SYSTEMS

This project is aimed at developing a model of culturally specific information associated with water and the river corridor, to expedite the inclusion of culturally specific information in river corridor and water resources management. It should be noted that water and river corridors were chosen in this research scheme because of their ecological and cultural importance. Riparian ecosystems are ecologically important because they play a diverse role in the functioning of freshwater ecosystems (Srivastava, 1995). They provide critical physical and biological linkages between terrestrial and aquatic environments, protecting stream channel health and supporting plant, animal and vertebrate species (Srivastava and Gupta, 1995). River corridor areas have historically provided diverse vegetation communities, water and other resources to the indigenous population of the arid west. The growing recreational, ecological, and cultural resource value of river corridors in the western portion of the United States makes them an important areas for continued research (Auble, et.al.1994).

Water was also chosen because it is apparent that reserved Indian water rights have established Native American people as important players in the arena of Euro-American water rights (Checchio and Colby, 1993). With the quantification of Reserved Indian Water Rights by many Native American Tribes in the western United States, Native American Tribes are being recognized as senior water right holders of large volumes of surface water (Checchio and Colby, 1993). Although these reserved rights are for future use, they are not subjected to the 'use or lose' criteria of Euro-American water law and may be enacted when a need for them arises. Euro-American water authorities are forced to recognize the significance of the Native American reserved rights within the basins where those rights occur (Checchio and Colby, 1993).

Eastern Shoshone and Northern Arapaho ecological and cultural knowledge associated with water and the river corridors was collected through anthropological methods to explore the use of culturally specific information in water resource management practices. Culturally specific information databases were extracted from the results of ethnographic interviews and were interpreted to develop a model of the Tribal world-view. The process the Shoshone and Arapaho Tribes apply to make decisions associated with water and the river corridor was extracted from Tribal water laws. Finally, the Wyoming state water statues

were analyzed for the occurrence of Shoshone and Arapaho culturally specific information. The research focuses on the occurrence of culturally specific information within the Euro-American context of water resource management, and discusses ways of achieving integration of these two ways of thinking.

1.4 DEFINITIONS

Culturally specific information, traditional ecological knowledge, and indigenous knowledge systems will be used throughout this thesis. For the purpose of this study the following definitions will be applied:

- *Culturally specific information (CSI)* is defined as information that reflects a cultural association with the land, traditional landuse practices, or traditional knowledge of biodiversity and/or ecology (Parker, 1993). For example, Andean indigenous groups used the bark of the Peruvian cinchona tree (which contains quinine-used to treat malaria) as a cure for fevers (Roht-Arriaza, 1996).
- *Indigenous ecological knowledge* refers to elements of the indigenous knowledge that reflects an understanding of biodiversity and ecological behavior of a geographically defined ecosystem. This knowledge evolves over time and is often passed down through oral tradition (Shoenhoft, 1993).
- *Indigenous knowledge systems* represent shared knowledge of an indigenous culture that has evolved in a particular environment and is informally expressed in local customs, technology, and wisdom (Shoenhoft, 1993). Indigenous knowledge systems are comprised of elements of indigenous ecological knowledge and culturally specific information. For example, for thousands of years, indigenous farmers in India have used the leaves and seeds of the neem tree as a natural insecticide (Roht-Arriaza, 1996).
- A *river corridor* is defined as an area encompassing both the stream channel and the riparian ecosystem.

This thesis discusses the application of elements of information from the indigenous knowledge systems that may inform water resource management practices. Knowledge is defined as "the sum or range of what has been perceived, discovered, or learned " (Webster, 1984). Information informs the knowledge base of an individual or a group. It is defined as "knowledge derived from study, experience, or instruction" (Webster, 1984). The distinction between knowledge and information is needed since the terms will be used extensively throughout this thesis.

The definitions listed above will be used to achieve the objectives that are listed in the following section of this chapter. Concrete objectives have been established to ensure the scientific integrity of the research at hand. The accomplishment of these objectives, through the scientific method, will enable the researcher to draw conclusions on the application of Shoshone and Arapaho culturally specific information (CSI) in Wyoming water resource management.

1.5 OBJECTIVES

1. Apply ethnographic research techniques to identify culturally specific information associated with water and the river corridor environment.

2. Describe the social, political, and hydrologic characteristics the watershed and river corridors being managed by the Wind River Tribes-including the people, their relationship to the watershed, and their activities within the watershed.

3. Define the process applied by the Tribes to make management decisions associated with water and the river corridor by analyzing Tribal water law for the occurrence of culturally specific information.

4. Compare the Tribal decision making process with the water management criteria applied by the State of Wyoming and the Federal Government through the Wyoming state water statutes.

This thesis is organized in the following fashion-the concepts of indigenous knowledge and indigenous knowledge systems will be examined in the literature review, with explicit regard to water (Chapter 2). The Methods section outlines the methods and analysis procedures employed on the Wind River Reservation to meet the objectives of this study (Chapter 3). This is followed by the presentation of the research results and a discussion of the data analysis, with regard to the research objectives (Chapter 4). The conclusion discusses the knowledge gained through the research conducted on the Wind River

Reservation with respect to the incorporation of culturally specific information and indigenous knowledge systems with Euro-American resource management techniques (Chapter 5).

CHAPTER 2-LITERATURE REVIEW

2.1 BACKGROUND

> *"Indigenous knowledge systems represent shared knowledge of a local community that has evolved in a particular environment and is informally expressed in local customs, technology and wisdom."*
>
> Shoenhoft, 1993, Page 10

The study of indigenous knowledge systems has been a staple of anthropology since the turn of the 20th century (Brush, 1993). In this time, Anthropological research on traditional knowledge has documented the breadth, complexity and sophistication of such systems, and demonstrated the structural similarities between indigenous and Euro-American knowledge systems (Berlin, 1992). These findings have contributed to the acceptance of indigenous knowledge as systematic and valuable in the Euro-American scientific community.

Anthropologists recognize traditional knowledge as having both structure and utility within the indigenous knowledge system (Brush, 1993). Originally, the term indigenous was used interchangeably with folk or traditional in anthropological research and was depicted as "local" or "non-formal" knowledge (Brush, 1993). This depiction of indigenous knowledge implied that the information contained within the knowledge system was simply useful in a local context, and could not be integrated with other knowledge systems for application in modern society. In addition, the use of traditional or folk implied a notion of static knowledge to Euro-American scientists, i.e. knowledge systems that are unaffected by societal and environmental changes (Redford, 1991). This notion disregarded the dynamic nature of culture and indigenous knowledge systems, which are predicated upon the changing dimensions of cultural groups (DeWalt, 1994).

A different usage of the term indigenous emerged after 1980, as anthropologists placed increasing emphasis on the loss of cultural societies with the expansion of European culture on a global scale (Brush,

1993). Today, the use of "indigenous" emphasizes ethnic groups whose cultures have not been absorbed by Euro-American culture or the culture of more populous surrounding societies, implying cultural autonomy (Bodley, 1990). This cultural autonomy is exemplified by indigenous groups that have maintained their cultural identities within the societies that have dominated them (Bodley, 1990).

2.1.1 CULTURE, KNOWLEDGE AND THE ENVIRONMENT

Anthropologists have recognized that culture identify and beliefs of a society defines their world-view, the set of assumptions about reality and the world that a society holds, and determines the way people interact with nature (Sterling, 1990). Anthropological research has also shown that a societies' world-view influences behavioral decisions and the formulation of knowledge (Sterling, 1990). In other words, the information contained in indigenous knowledge systems is based on relationships between a cultural group and their discrete ecosystems (Shoenhoft, 1993). Indigenous societies have applied culturally specific information and indigenous ecological knowledge of their surrounding to understand, harvest, and control their local ecosystems (McNeely, 1993; Roht-Arriaza, 1996). Some indigenous societies have utilized this knowledge to subsist with their surroundings, developing sustainable methods of resource use and conservation bio-diversity (Cunningham, 1991). A large body of research credits indigenous societies with protecting biological diversity through sustainable ecosystem management techniques around the world (Tisdell, 1995; McNeely, 1993; Roht-Arriaza, 1996; Cunningham, 1991; Ruppert, 1996).

Indigenous societies perceive their resource base as limited to a discrete geographic area, finite, and sensitive to resource use (Gadgil, et. al., 1991). Through traditional resource use, they have gained an understanding of the interconnectedness of the different components of the ecosystem and view the natural world in a holistic manner, which stresses the interaction of all ecosystem components (Johnson, 1992; Roht-Arriaza, 1996).

This holistic view held by some indigenous societies differs from the world-view held by Euro-American Industrial nations (Table 2.1). The view held by Euro-American societies attempts to explain the elements of the natural world as discrete entities within an ecosystem, rather than emphasizing the interconnectedness of the elements of matter and ecological behavior (Gadgil, et. al., 1991). The resulting manner by which Euro-American society interacts and manages its natural environment has been

Table 2.1: Comparison of Euro-American Knowledge and Indigenous Knowledge (Johnson, 1992)

Indigenous Knowledge	Euro-American Knowledge
Holistic: all elements of matter are viewed as interconnected and cannot be understood in isolation	Reductionism: deliberately breaks down data into smaller elements to understand whole and complex phenomenon
Based on long time series of information on one locality (diachronic data)	Based on short time series over a large area (synchronic data)
Based upon data generated by resource users	Based upon data collected by specialized groups of researcher who tend to be more selective and deliberate in the accumulation of facts
Explanations of environmental phenomena are often spiritual and based on cumulative, collective experience. It is checked, validated, and revised daily and seasonally through annual cycle or activity	Employs methods of generating, testing, and verifying hypotheses and establishes theories and general laws as its explanatory basis
Rooted in a social context that sees the world in terms of social and spiritual relations between all life forms	Hierarchically organized and vertically compartmentalized
Recorded and transmitted through oral tradition	Employs written word
Learned through observation and hands-on experience	Taught and learned in a situation usually abstracted from the applied context

referred to as the "dominance over nature" world-view (Gadgil, et. al., 1991). It is based upon Euro-American science, which assumes that the behavioral processes of nature can be understood and controlled through application of scientific methods (DeWalt, 1994). Accordingly, nature is analyzed by asking systematic, testable question aimed at achieving a desired outcome (Gadgil, et. al., 1991). In this way, nature is brought under control for human benefit.

A relationship with the environment that is primarily exploitative and manipulative has resulted in Euro-American nations (Johnson, 1992). Euro-American societies have historically controlled and used nature for their own interests, giving little concern to the cumulative effects of resource use on the environment (Johnson, 1992). Euro-American cultures have come to view natural resources as unlimited and geographically available throughout the world (Sterling, 1990). Until the environmental movement of the 1970's, conservation of resources and the sustainability of ecosystems were not given precedence in industrial nations (Griffiths, 1990). The maintenance of sustainable ecosystems is emphasized by subsistence, indigenous societies that depend on discrete resources for their survival (Gadgil, et. al., 1991).

2.1.2 Resource Management According to Euro-American Society

The finite nature of the world's resource base first began to be evident in Euro-American society with the rise of consumerism, technology, and growing populations in the second half of the nineteenth

century (Gadgil, et. al., 1991). Resource management science and scientific prescriptions for restrained resource use began to emerge (Gadgil, et. al., 1991). Until this point, natural resource management was based upon the "dominance over nature" world-view. This view was the basis for management techniques such as: maximization of fish yields and crops, clear cutting large tracts of land for timber, predator control, hydroelectric power, forest fire suppression, and open pit gold mining. These techniques helped to perpetuate the perception of natural resources as infinite, controllable, and attainable for human use (Sterling, 1990). Human interaction and management of the environment in the Euro-American industrial nations was shaped by this "dominance over nature" approach, which expanded to govern resource management around the world (Sterling, 1990).

Resource management techniques coined in the dominance over nature ideology were applied to manage, extract, and use resources for economic gain and have resulted in unrestrained resource use and environmental degradation of the world's natural ecosystems (Gadgil, et. al., 1991; Burton, 1991). Little consideration was given to the longevity of the resource base, the possible harm to the biologic systems, or the interrelation between ecosystem components (Burton, 1991). The failure of Euro-American techniques to achieve environmentally sustainable resource management solutions and the resulting loss of biological diversity around the world prompted the establishment of *Our Common Future,* the 1987 United Nations World Commission on Environment and Development (UNCED) report (World Commission on Environment and Development, 1987). This internationally influential report stressed the need for sustainable solutions for resource management and development, and prompted research in the maintenance of ecosystem and cultural diversity around the world (Clarke, 1990).

The need for sustainable solutions expressed in *Our Common Future* (World Commission on Environment and Development, 1987) is exemplified by water law in the Western United States. The discussion that follows provides an example of the failure of Euro-American techniques to achieve environmentally sound solutions. The nature of western U.S. water law and the resulting lack of sustainability are discussed as a means of exemplifying the need for to explore different approaches to ecosystem management that may be available through indigenous knowledge systems.

WATER IN THE WEST: AN EXAMPLE OF UNSUSTAINABLE RESOURCE MANAGEMENT APPROACHES

The Prior Appropriation Doctrine, enacted in 1872, determines the distribution and use of water resources by individual water right owners (Clyde, 1989). The doctrine is premised on 'first in time, first in right', 'beneficial use', and "use it or lose it" reasoning (Clyde, 1989). "First in time, first in right" rewards water rights chronologically to those who were simply the first to divert water from its natural watercourse for use. Little regard is given to efficiency of use or the environmental consequences of the active diversion (Clyde, 1989). The term 'beneficial use' defines the manner in which water rights may be applied; it defines the measure and the limit of a water right. The use of a water right is considered beneficial if it promotes economic activities (Clyde, 1989). In general, water must actually be diverted and consumed in some way, if the use is to be considered beneficial (Clyde, 1989). The ecological need for minimum instream flow levels within stream channels is generally not considered a beneficial use for this reason. Finally, the principle of 'use or lose' mandates that water right holders use all of the allotted volume of water to its stated beneficial use, or forfeit that right (Clyde, 1989). The 'use or lose' approach encourages excessive use of water and the removal of allotted volumes of water from natural stream channels, rather than promoting water conservation and the conservative use of this resource (Wilkinson, 1990).

The management of water through the Prior Appropriation Doctrine (1872) and western water law provides an example of a lack of sustainability in Euro-American resource management approaches (Wilkinson, 1990). The need for water in the diverse region of the western United States exceeds the yield associated with the average annual rainfall. Water demand in the West is predominantly based on domestic use, agricultural irrigation, ranching, and industrial use. In order to meet the need for water resources, systems of water diversion and storage have been constructed upon the lands for storing and controlling the movement of the water (Wilkinson, 1990).

The doctrine has encouraged control over and maximum use of water for economic development by private parties by way of diversion and storage of channel stream flows (Wilkinson, 1990). It exemplifies a dominance over nature view of resource management, whereby control and use of water for economic purposes replaces water conservation, stream channel health, and the ecological, cultural and

aesthetic value of water in the landscape (Wilkinson, 1990). The ecological effect of the removal of water from the stream channel on ecosystem and watershed health has been historically disregarded in the determination of water right allotments in the western United States (Wilkinson, 1990). This doctrine exemplifies the need to depart from accepted and harmful resource management techniques and to develop alternate, sustainable methods for resource and ecosystem management (Wilkinson, 1990).

2.1.3 A Call for Indigenous Ecological Knowledge

Anthropological research in indigenous ecological knowledge has revealed a wealth of empirical indigenous knowledge associated with the local ecosystems of indigenous cultural groups (Johnson, 1992). It has also revealed that some indigenous communities have been successful at maintaining the biological diversity of local ecosystems around the world through the application of this knowledge in practice (Brush, 1993). The lack of recognition of indigenous management techniques lies in the idea that Euro-American science alone can provide solutions to clearly defined questions and problems (Sterling, 1990). The success of science has created a tendency to accept the Euro-American scientific solution to resource management as the only acceptable solution to resource management questions (Sterling, 1990). Because science assumes all value judgments are subjective and unreliable, ideas and solutions founded upon indigenous or cultural knowledge are assumed to lack 'proper knowledge' or 'scientific value' (Sterling, 1990). As a result, science dominates the view of Euro-American society, which defines the beliefs, values and methodologies that modern conservation ethics and environmental management are founded upon (Sterling, 1990). However, the UNCED report recognized the value of indigenous environmental knowledge and resource conservation techniques as a model for sustainable resource management solutions. In addition, it acknowledged the idea that sustainable solutions for resource management require respect for the long term requirements of nature that are exhibited in the holistic views of indigenous cultures (Clarke, 1990). Additional attention has been given to the study of indigenous ecological knowledge and knowledge systems following the 1992 United Nation's Convention on Biological Diversity (Roht-Arriaza, 1996).

2.1.4 The View of Native American Indigenous Knowledge

Despite the United Nation's recognition of indigenous knowledge, the indigenous knowledge base

of Native American societies has not been recognized as a valuable source of ecologically significant information in the United States (Ruppert, 1996). This lack of recognition stems from a history of Native American treatment in the United States and the resulting opinions of Native American Tribes by people of Euro-American descent (White, 1985). Several issues are discussed in the following paragraphs that will illustrate the lack of acceptance of the value of Native American ecological knowledge.

The Historical Origin of the View of Native American Knowledge

The Federal Government of the United States has historically viewed Native American land occupancy and use as an obstruction to westward expansion and land ownership (Lewis, 1995). The nomadic lifestyles and holistic view of the environment held by Native American people made the notion of exclusive land ownership inherent in the settlement of the American west incomprehensible (The State Historical Society of CO, 1959). Thus, conflict between Native American Tribes and Euro-Americans was often based upon the cultural difference in their land management philosophy (Burton, 1991). Force of arms and the sheer numbers of the Euro-Americans eventually determined that the Euro-American view of land ownership would come to dominate the western landscape. Native American Reservations were negotiated. Two cultures with different views of the environment met, and Euro-American standards determined the course of management of the lands that provided Native Americans subsistence and spiritual fulfillment (Burton, 1991). As a consequence, the use and management of natural resources by Native people was limited to use within discrete islands of reservation lands in the landscape of the United States (Lewis, 1995).

Federally supported policies such the Homestead Act (1862), the Hard Rock Mining Act (1872), and the Reclamation Act (1902) continually encouraged and enabled individual settlers, miners, and corporations to obtain private vested rights in land and resources in the western United States (Wilkinson, 1989). They reflect Euro-American societies' choice to view natural resources and the environment in terms of private parties rights to capture and use them, rather than as public resources to which all individuals retained a right (Wilkinson, 1990). These policies eventually led to the diminishment of Indian land and resources, while relegating Indians to the political and economic periphery of American society where they continue to search for their voice in the land and resource management arena (Lewis, 1995).

These US resource policies led to the deterioration of environmental quality, which evoked the environmental movement of the 70's (Burton, 1991). During the 1970's, Native Americans emerged as a symbol for environmental stewardship in contemporary Euro-American society (White, 1985; Huffman, 1992). In this context, the relationship that Native Americans had with the landscape and their environmental view has been trivialized. It has been perceived to be valid as a symbol of environmental protection, but not as a viable avenue to resource management solutions (White, 1985; Hoffman, 1992). Native Americans have been viewed as a collective group of people carrying a simplistic view of the landscape, rather than unique groups of people who have unique cultural relationships with and knowledge of their specific land and natural resources.

The complex ecological knowledge and intimate understanding of the land held by unique Tribes have been disregarded by early Native American policy and the ensuing symbolic view of native people (White, 1985; Huffman, 1992). The scientific community has not recognized the understanding of ecosystem function represented in Native American knowledge and resource management practices (Pinkham, 1996). Some examples of Native American knowledge include: knowledge of the growing season, distribution patterns, and behaviors of plants and animals; and the understanding of climate and seasonal conditions of the geographic area in which they reside (Lewis, 1995). This type of knowledge differs from knowledge entwined in the Euro-American perspective since the information is learned through direct experience with the local environment over time (Schoenhoft, 1993). Knowledge of the local ecosystem is passed down verbally from elder tribal members, such that the catalogue of indigenous ecological information is continually added upon (Schoenhoft, 1993). This information is often overlooked because it has not been recorded as scientific text (Lewis, 1995). The culturally specific information acquired by these unique cultural groups has been overwhelmingly disregarded in the development of resource management solutions (Lewis, 1995; Cordell, 1993). Similarly, Native American customary landuse and resource management practices and techniques for protecting biological diversity have not been given much attention in research focusing on indigenous knowledge systems (McNeely, 1993; Pinkham, 1996; Lalonde & Morin-Labatut, 1995).

THE LIMITATIONS REFLECTED IN CULTURAL RESOURCE POLICY

The lack of legitimacy of Native American culturally specific information and knowledge systems is also apparent in the way the United State and Euro-American society views and manages cultural resources (Ruppert, 1996). In general, cultural resources in the United States reflect the history of Euro-American expansion by Euro-American settlers, rather than the diversity of land use and management by different indigenous cultural groups (Ruppert, 1996). The National Park Service (NPS) is responsible for the oversight of cultural resources within National Parks in the United States, through the National Preservation Act. Within this policy, cultural landscapes are defined as areas that have been modified in ways that reflect phases in the history of a people, a country or a region (Ruppert, 1996). Initially, these cultural landscapes included areas of farming, ranching, mining and other settlements that saw a continuity of use through generations and had maintained an element of historic integrity (Melnick, 1980). Within federal and state programs, cultural landscapes have been categorized as important from a Euro-American perspective, with emphasis being placed on how immigrants to the US modified the landscape for their own purposes and economic expansion (Ruppert, 1996).

This view of cultural information from a historical perspective has helped to maintain the lack of acknowledgment of indigenous knowledge systems and land management practices (Ruppert, 1996). Within this historical perspective of culture resources, culturally specific information is assumed to be static (Ruppert, 1996). In this way, cultural value is limited to specific periods in history and the practical applicability is assumed obsolete beyond those periods. Cultural resource programs have focused on the preservation of sites of historic and cultural significance, rather than on creating ethnographic records of culturally specific information that may be utilized (Ruppert, 1996). However, attempts to incorporate the dynamic nature of culture and culturally specific information into cultural resource management agendas are beginning to be made by the National Park Service.

NEW DIMENSIONS IN CULTURAL SIGNIFICANCE, NATIVE AMERICAN KNOWLEDGE & RESOURCE POLICY

The National Park service has recognized the international development community's efforts to place value on indigenous environmental knowledge systems and culturally specific information (Ruppert, 1996). As a consequence, a new category of cultural landscape has been defined in the National Historic

Preservation Act, the Traditional Cultural Property (TCP) (Parker, 1993). A TCP is defined as, "a property or place that is eligible for inclusion on the National Register of Historic Places because of its association with cultural practices and beliefs that are rooted in the history of a community and are important to maintaining the continuity of that community's traditional beliefs and practices" (Parker, 1993, p.1).

According to the definition of a TCP, indigenous peoples' cultural perspective of land use should be incorporated into the determination of TCPs on Federally owned lands in the United States (Parker and King, 1993). Unfortunately, available ethnographic records rarely contain culturally specific information related to the land and resource management. Therefore, methods for recording, protecting and applying culturally specific information that is related to landscapes, ecology and resource management are needed. The inclusion of Native American information associated with the land within the category of TCP or its employment in resource management stems upon the development of such methodologies (Ruppert, 1996). The need for developing clearly defined methodologies for examining and integrating indigenous knowledge is apparent in indigenous knowledge research on a global scale. These research needs must be addressed if indigenous knowledge is to be practically applied and accepted in the development of sustainable resource management techniques within and outside indigenous communities.

2.1.5 Methods of Identifying, Protecting and Utilizing Indigenous Knowledge

It is apparent that the relationship between indigenous environmental knowledge and environmental behavior has not been adequately examined or systematically advanced by anthropological or indigenous knowledge research (Akimichi, 1978). Research examining the possibility of integrating indigenous knowledge systems with Euro-American scientific knowledge has focused on investigating local expertise and identifying similarities between indigenous and technological knowledge systems (Horton, 1967; Shoenhoft, 1993; Yakubu, 1994; Lalonde & Morin-Labatut, 1995; Aliu and Mohammed, 1990). The results of this research have shown that Euro-American science and technology, and indigenous thought and practice are both seen to engage in explaining and controlling the environment at levels that support specific goals (Aliu and Mohammed, 1990). In other words, similarities in the application of indigenous and Euro-American knowledge exist. This research has provided evidence that supports the idea that indigenous environmental knowledge may provide alternative approaches to managing natural resources in a sustainable manner (Aliu and Mohammed, 1990). Unfortunately, the

question of how this will be accomplished has not been adequately addressed (Lalonde & Morin-Labatut, 1995). Instead, research has focused on defining the similarities in the knowledge bases, which placed very little emphasis on analyzing the success of indigenous resource management approaches outside of the discrete ecosystems in which they were derived or developing methods for accomplishing this task. This type of research is necessary if indigenous resource management techniques are to be applied to Euro-American resource management scenarios. The need for developing methods for identifying and integrating indigenous ecological knowledge and management approaches with Euro-American scientific knowledge are needed to advance techniques in sustainable ecological management (DeWalt, 1994).

Modeling Indigenous Knowledge and Behavior

If we simply wished to extract elements of indigenous knowledge systems from indigenous societies, an understanding of how indigenous cultures characterize, assign importance, and apply their knowledge to manage their environment would not be necessary. This is not the desire of this research. The need for providing indigenous societies an equal role in the decisions being made about their resource base was made apparent through bio-diversity conservation and indigenous property rights research (King, et. Al., 1996; Roht-Arriaza, 1996; Cunningham, 1991). The integration of indigenous and Euro-American methods of resource management must respect the indigenous notion of cultural importance and the criteria upon which indigenous societies apply culturally specific information to make resource management decisions (Lalonde & Morin-Labatut, 1995; DeWalt, 1994; Cashman, 1991; Akimichi, 1981).

The investigation of how indigenous societies make decisions about the use their environment has long been an area of interest to anthropologists (Barlett, 1977; Galdwin, 1980; Johnson, 1992; Tversky, 1972). Only recently has the importance of understanding this relationship been emphasized for achieving successful integration of Euro-American and indigenous knowledge in resource management (Brush, 1993). Brush (1993) discusses the role of anthropological techniques and models in determining equitable ways of integrating these knowledge systems into resource management solutions. He argues that anthropological techniques and models must be applied to examine the relationship between a society's perception of the environment and the resulting management behavior, if environmental equity in resource management is to be achieved for indigenous societies. He concludes that both biological diversity and cultural diversity, in the form of culturally specific information, are conserved in this manner (Brush,

1993). Lalonde & Morin-Labatut (1995) argue that the integration of indigenous knowledge systems into resource management strategies has the potential to contribute to sustainable and equitable long-term development, if attention is paid to environmental perception, environmental behavior, and the process applied in making environmental decisions.

It is necessary to create a conceptual model of a culture's 'world-view' in order to examine the indigenous environmental behaviors that develop within that view (Nazarea-Sandoval, 1991). Developing models that define the world-views of cultural groups, and the environmental reality upon which those views are premised, enables the examination of the relationship between environmental perception and environmental management behaviors (Nazarea-Sandoval, 1991).

Rappaport (1979) defined such a set of models as the *cognized model* and the *operational reality* of a society. He defines the cognized model as a "description of a people's knowledge about their environment and their beliefs concerning it." This model represents a society's understanding about their world; it is developed through the application of ethno-scientific techniques (Nazarea-Sandoval, 1991; Alcorn, 1980). It defines the criteria upon which decisions about the environment are made by explaining a society's perception of the environment and their response to the opportunities and constraints posed by the social and ecological structure of that environment (Nazarea-Sandoval, 1991). The opportunities and constraints posed by the social and ecological structure of that environment are defined by the *operational reality model.* It is defined as "the actual structure of the ecosystem being managed-including the people, their relationships, and their activities from an objective, scientific point of view" (Rappaport, 1979). This model provides the context and sets the boundaries for decisions that are made about the environment and natural resource management (Nazarea-Sandoval, 1991). It is necessary to define the characteristics of the environment that a society is faced with in order to determine the environmental constraints that society must consider.

Several researchers have applied the cognized model/operational reality concepts to examine the relationship between environmental perception and management behavior (Nazarea-Sandoval, 1991;Cashman, 1991; Alcorn, 1980). Nazarea-Sandoval (1991) employed these concepts to determine the indigenous criteria for determining environmental management decisions used by the inhabitants of Kabarian, Philippines to classify biological resources, determine landuse options, and select rice varieties to

be farmed. She also emphasized the necessity of understanding this relationship for achieving successful integration of Euro-American and indigenous pest management strategies (Nazarea-Sandoval, 1991). Alcorn (1980) applied this framework to model the relationship between Haustec Mayan plant resource recognition and decisions that concerned agriculture. Nazarea-Sandoval (1991) pointed out that researchers are also faced with the question of how indigenous cultures determine decisions associated with their environment and natural resources. She emphasized the necessity of examining this relationship for achieving successful integration of Euro-American and indigenous management strategies. Lalonde & Morin-Labatut (1995) echoed her finding in their research on sustainable development and noted that understanding the criteria upon which individuals base resource management decisions enables the comparison of indigenous resource management and Euro-American resource management techniques (Lalonde & Morin-Labatut, 1995). They argued that this comparison was necessary before integration was possible. Such comparisons and analyses may lead to effective, sustainable, and culturally equitable solutions to the world's environmental and ecological problems.

2.1.6 WAYS OF EXAMINING DECISION MAKING PROCESS IN WATER RESOURCE MANAGEMENT

Laws reflect the decision making process associated with Euro-American resource management policies (Wilkinson, 1990). The incorporation of specific societal values in the laws that direct the management of the environment reflect the importance of those values within the decision making process of a culture (Wilkinson, 1990). In this way, laws should reflect a society's understanding of their world and should also take into account the constraints on the ecosystem being managed, including the people, their relationships, and their activities from an objective, scientific point of view. For example, water laws in the western United States should reflect the surface water availability by promoting water conservation rather than the 'use or lose' restrictions. In addition, cultural and social uses of water should be equally considered with economically driven needs for water.

Tisdell (1995) conducted research in China, which focused on the developing laws that reflect the holistic world-views of indigenous people. She asserts that the application of indigenous views and knowledge in law assures the application of biodiversity conservation in a sustainable manner. Similarly, Wilkinson (1990) found that Euro-American water law represents Euro-American values when he analyzed the western water statutes. This argument supports the use of law as an avenue for determining whether

culturally specific information is represented and reflected in the resource decisions predicated upon those laws. This research compares Wyoming water law and the Tribal Code of the Wind River Native American Tribes to assess societal values of the Wind Rivers Native Americans.

CHAPTER 3.0 - METHODS & ANALYSIS

Ethnographic data collection and analysis techniques were used to collect and determine a set of culturally specific information associated with water and the river corridor. The data collected does not represent a full catalogue of Shoshone and Arapaho culturally specific knowledge; it is a limited catalogue based on the knowledge of the sample population. The methods and analysis techniques are discussed in the following sections of this thesis.

3.1 METHODS

3.1.1 INDIGENOUS KNOWLEDGE RESEARCH

The data collection and analysis processes yielded a description of the world-view of the Shoshone and Arapaho people (Figure 3.1). The hydrologic and ecological conditions of the basin, and the social and economic demands for water by the Tribes and the non-Native American population are described in order to depict the societal and natural significance of water within the watershed. These demands for water resources act as constraints, which limit the ability of Native Americans to freely apply water to culturally explicit purposes. It is therefore necessary to consider these constraints and how they shape the manner in which the Tribal world- view is acted upon in making decisions. Indigenous knowledge systems, indigenous ecological knowledge, resource management, and societal laws are all based upon a society's world-view and the environment. The question of whether Native American culturally specific information is reflected in Euro-American water management techniques can therefore be determined by analyzing the world-view and decision making process of the Tribal societies. This was done by analyzing Tribal and State Water Laws to determine whether Shoshone and Arapaho culturally specific information is present in the water management schemes of the Tribe and the State.

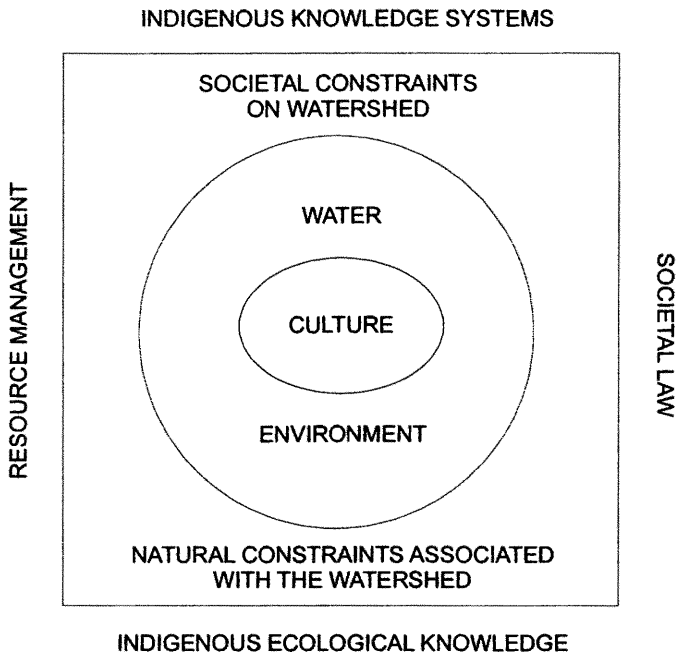

Fig. 3.1. Overview Diagram
Culture and environment interact through societal and natural constraints that influence indigenous ecological knowledge, indigenous knowledge systems, societal law, and resource management.

The data collection and analysis procedures are outlined in the flow charts located on the following pages (Figure 3.2.A., 3.2.B.) The process steps are further discussed in sections of this chapter that correspond with the numbers and headings represented in the process blocks.

3.1.2 PRELIMINARY SITE VISITS

A preliminary site visit was made the weekend of March 12-14, 1998. This site visit was intended to provide background on the landscape and culture of the Wind River Reservation. Mr. Wes Martel and Mr. Don Aragon hosted the visit. Mr. Martel is a member of the Shoshone business council and President of the Wind River Associates, an environmental consulting firm. He is a member of the both the Shoshone and Arapaho Tribes. Mr. Aragon is Coordinator of the Wind River Environmental Council, an environmental action agency established by the Shoshone and Arapaho Joint Business Council, and is a member of the Shoshone Tribe.

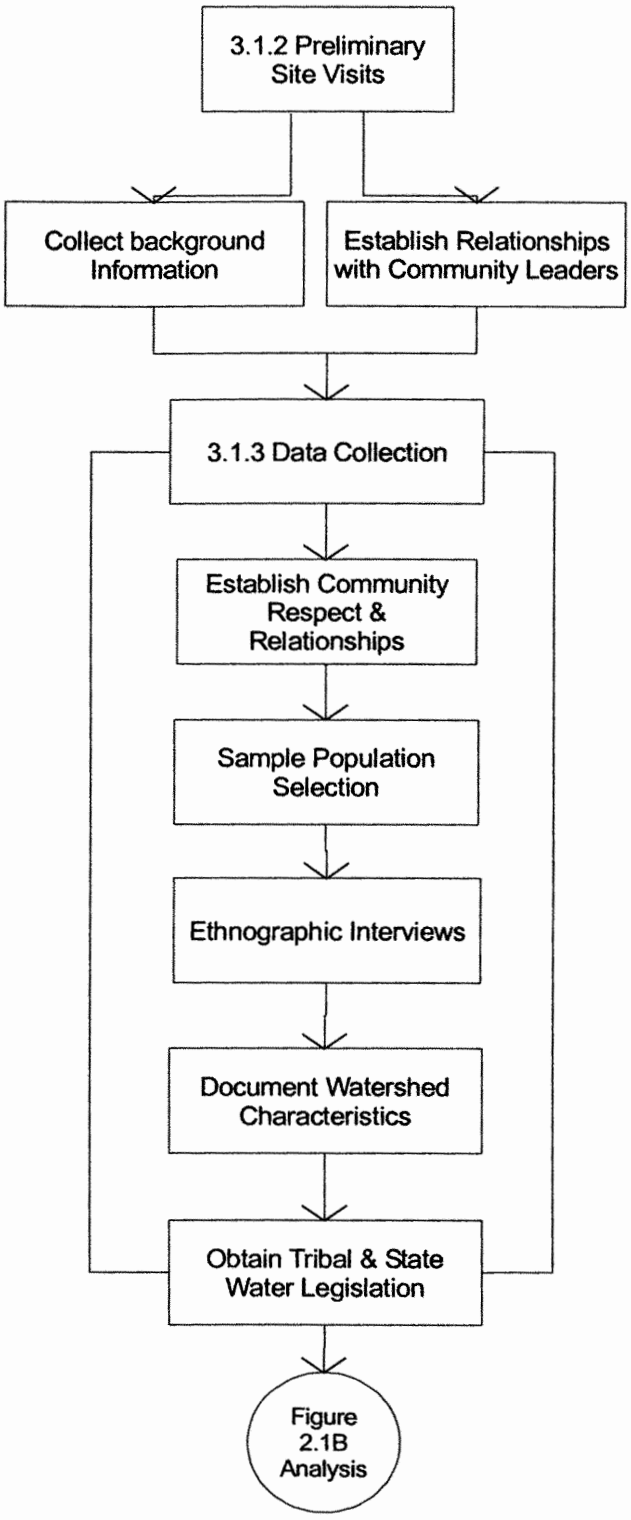

Fig. 3.2A. Data Collection Flow Diagram

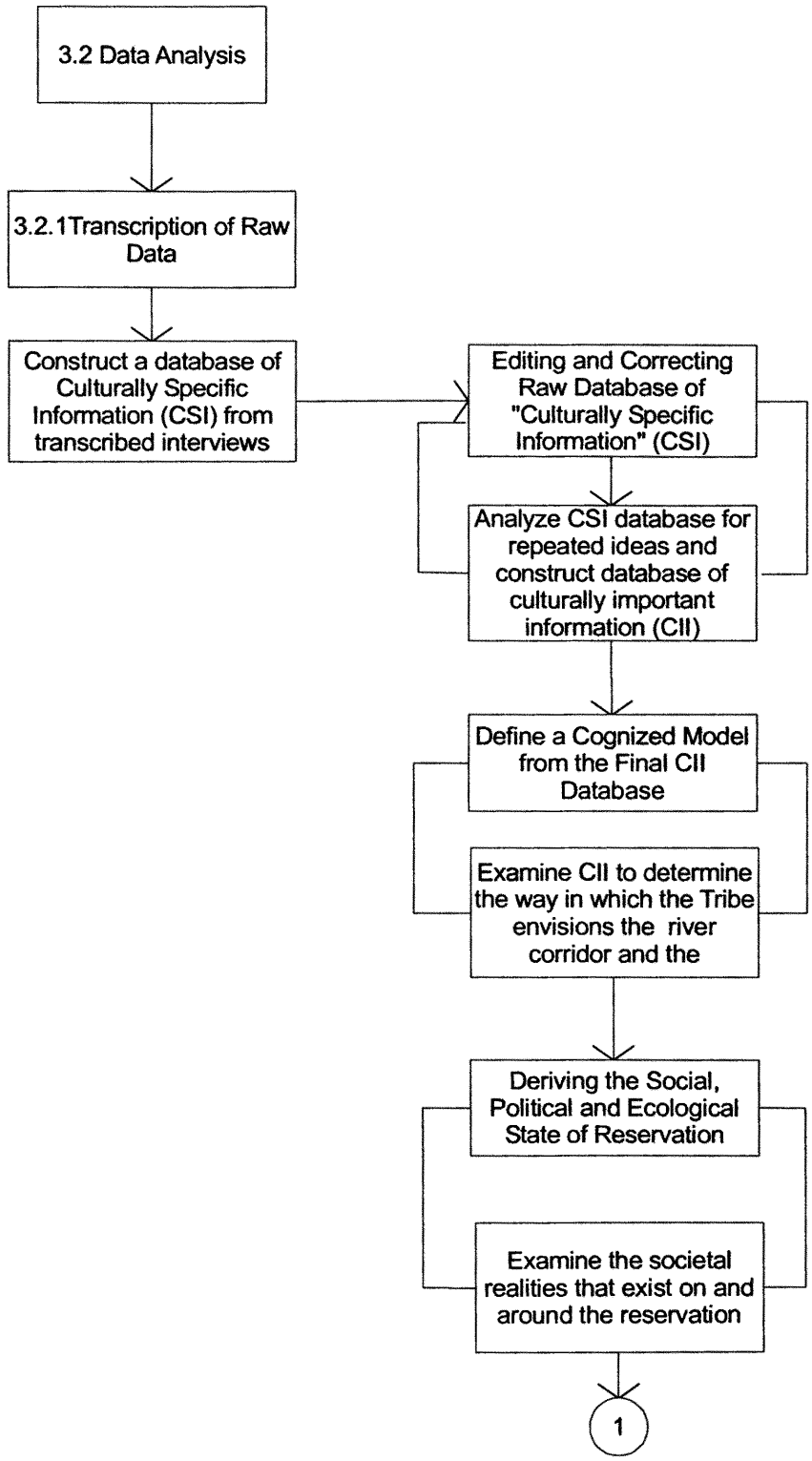

Figure 3.2.B. Data Analysis Flow Diagram

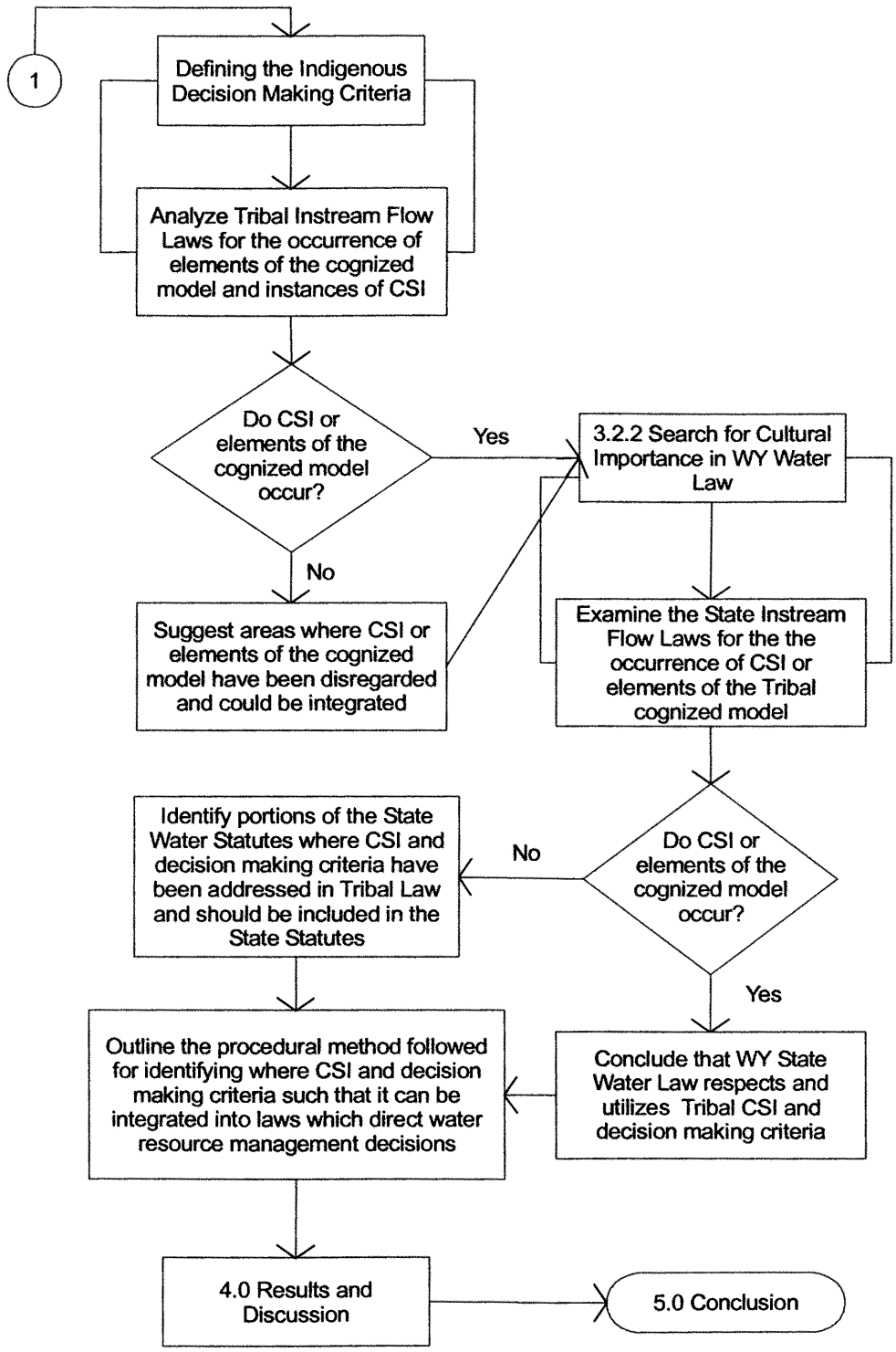

Fig. 3.2.B. Data Analysis Flow Diagram (Continued)

Mr. Martel led numerous tours of the reservation, including visits to sites that are or have been seen as areas of contention with respect to water and river corridor management. Individual interviews were conducted with Mr. Martel and Mr. Aragon. These interviews focused on current and historical landuse on the Reservation, traditional lifestyles of the Shoshone and Arapaho people, reserved Indian Water Rights, issues concerning water resources, the health of the river corridors, and water management policies currently in place on the Reservation.

3.1.3 DATA COLLECTION

Indigenous ecological knowledge and culturally specific information associated with water and river corridors on the Wind River Indian Reservation were collected through interviews with individuals from a specifically selected sample population of Eastern Shoshone and Northern Arapaho Tribal members. This information was analyzed and compared with the established Tribal and State water laws to determine whether it has been integrated into the indigenous or Euro-American water and river corridor management practices. The data collection and interview processes occurred over an eight-month period, between May and December of 1998.

ESTABLISH COMMUNITY RESPECT AND RELATIONSHIPS

It is difficult to conduct ethnographic interviews within a community that is hesitant to trust individuals from social services and universities. Trust and proper relationships with community leaders and member of the Tribes was established in order to respectfully conduct research within this tribal community. Dr. Melinda Laituri and I met with the Shoshone and Arapaho Business Councils prior to the interview process. These meetings were conducted to attain permission to interview Tribal elders, healers, and culturally active members concerning the importance of water and the river corridor environment to the Tribes and Tribal culture.

Personal relationships with both the Arapaho and Shoshone tribal members were established through numerous site visits, social visits, and the interview process. Invitations to ceremonial events and social gatherings were extended by Tribal members, and were graciously attended. Participation in tribal sweat

lodge, the 'passing of smoke ceremony', and attendance at pow-wows and Sun Dance events provided the interviewer with insight into the traditional lives of the Tribes.

Sample Population Selection

The sample population used in this research consisted of individuals from the Shoshone and Arapaho Tribes possessing knowledge of tradition, culture, and indigenous ecological knowledge associated with water and the river corridor. This sample population was based upon the ability of individuals to provide elements of Shoshone and Arapaho oral tradition, language, and indigenous knowledge. A liaison between the researcher and the Tribes was needed to provide introductions and access to individuals in the cultural community. The initial point of contact between the Wind River Tribe and the researcher was made at Colorado State University (CSU). Mr Darwin St. Clair is a Shoshone tribal member or the Wind River Reservation who is employed by CSU as a career counselor for minority students. Mr. Wes Martel (Shoshone/Arapaho) was introduced to the researcher to act as a facilitator and liaison between the researcher and the Tribes. Mr. Martel arranged meetings with the Tribal Business Councils, The Wind River Environmental Quality Council, and individual tribal members, which facilitated the selection of the sample population. Individuals in the sample population were identified by members of the Arapaho and Shoshone community because of their Tribal role and their knowledge of cultural practices and information. Mr. Wes Martel, Ms. Merl Haas, and members of the Arapaho and Shoshone Tribal Business Councils assisted me in the final selection of this population. Individual Tribal members, who hold culturally specific positions within the community as ceremonial elders, healers or culturally active members were identified and interviewed (Table 3.1). Interviewees ranged in age from 35 - 80 years.

Conduct Open Ended Ethnographic Interviews

Methods of ethnoscientific elicitation were employed to develop a model describing the Shoshone and Arapaho criteria for assigning ecological and cultural importance to water and components of the river corridor. Informal interviews were performed with individuals from the selected sample population. Interviews were audio recorded using a micro-cassette recorder. Interviewees were asked to provide their name, age and Tribal affiliation prior to the question and discussion period. A series of questions aimed at

Table 3.1 Shoshone and Arapahoe Tribal Members Interviewed

Name	Tribe	Age	Tribal Role
Sandy Addison	Arapaho	33	Spiritual and Community Member
Stanford Addison	Arapaho	40	Traditional Healer
Don Aragon	Shoshone	45	Executive Director of Wind River Env. Quality Commission (WREQC)
David Ferris	Shoshone	55	Member of Wind River Env. Consultants (WREC)
Patrick Goggles	Arapaho	43	Spiritual and Community Member
Merl Haas	Arapaho	45	Spiritual and Community Member
Burtin Hutchinson	Arapaho	7	Tribal Elder
Wes Martel	Shoshone/Arapaho	45	Shoshone Business Council Member; President of WREC
Mark Soldier-Wolf	Arapaho	65	Tribal Elder
Harrision Shoyo	Shoshone	72	Tribal Elder
Anna Maria Shoyo	Shoshone	74	Tribal Elder
Star Weed	Shoshone	80s	Tribal Elder
Theresa White	Arapaho	57	Tribal Elder

documenting cultural practice, traditional ideas and indigenous ecological knowledge associated with water and river corridors of the Wind River Reservation were posed to each interviewee in random order (Table 3.2). Open discussion between interviewees (Figure 3.2) and interviewer occurred during the informal interview process. During discussions, very few specifics were revealed to the interviewer, since cultural, ceremonial and ethno-botanical knowledge is believed to be sacred, and is therefore only shared with Tribal members. For example, specific knowledge of the seasons of growth, habitat locations, and medicinal uses of specific species are known to traditional healers and those individuals who obtained this knowledge from their parents and grandparents. This type of sacred cultural information is protected by Tribal members and passed down to younger tribal members interested in Tribal traditional ways.

Table 3.2 Table of Interview Questions

Interview Questions
Can you express the cultural view of water held by Shoshone/Arapaho people?
What is/was the use and need for water in the environment to the Shoshone and Arapaho people in every day life?
What is/was the use and need for water in the environment to the Shoshone and Arapaho people in cultural practices?
Can you explain whether water in the landscape is important to the Shoshone/Arapaho people?
Could you explain how the river corridor was/is managed by Shoshone/Arapaho people?
Are indigenous techniques of managing the river corridor ecosystem still applied today?
Was/is the biologically diverse riparian corridor and stream channel culturally important to the tribes? How?

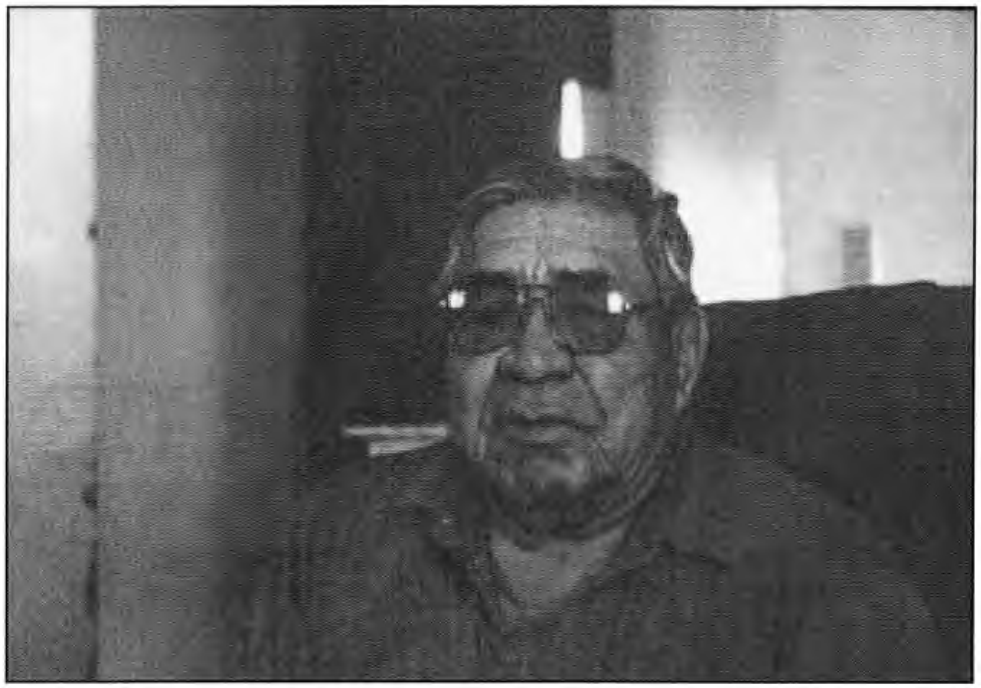

Fig. 3.3. A Member of the Sample Population Arapaho Elder, Burtin Hutchinson

DOCUMENT OF WATERSHED CHARACTERISTICS

Information associated with the political, social, economic, and environmental conditions surrounding water and the river corridors of the Reservation were gathered through interviews, site visits, and document searches. Hydrological characteristics of the Wind River Watershed were obtained from websites (USGS Web Site, 1999; Bureau of Reclamation Web Site, 1999) and reports prepared by the Wyoming US Geological Survey and the Wyoming Division of Wildlife under contract with the Wind River Environmental Quality Council (University of WY, 1996; WYDW, 1993). Additional information was gathered through a personal interview with the Wind River Reservation Tribal Water Engineer, Gary Collins (Collins, 1998).

OBTAIN TRIBAL AND STATE WATER LEGISLATION

Copies of Tribal Water Laws and Wyoming State Water Regulations were needed for analysis purposes. These regulatory statutes were analyzed to determine whether elements of the Shoshone and Arapahoe world-view are represented in the laws that determine how water and water resources are managed in Wyoming and the reservation. The analysis procedures are discussed in the data analysis

section of this chapter (Section 3.2). The water statutes (Chapter 41 of the Wyoming State Statutes, 1998) were examined for the presence of culturally specific information.

3.2 DATA ANALYSIS

The data analysis methodology used in this thesis was established from background research related to anthropological research methods (Brush, 1993). Interviews were transcribed and analyzed for recurring sets of information.

3.2.1 TRANSCRIPTION OF RAW DATA

Interviews were transcribed from micro-cassette recordings into a word processing template. The transcriptions were summarized to remove elements of tangential conversation that were not pertinent to the discussion of culturally specific information and its application in the management of the river corridor ecosystem *(Appendix A)*.

DERIVING 'CULTURALLY SPECIFIC INFORMATION' FROM RAW DATA INTERVIEWS

A dataset containing Shoshone and Arapaho culturally specific information associated with the river corridor of the Wind River Indian Reservation was constructed from transcribed interviews. These interviews were analyzed for ideas, stories, traditions, cultural practices, and Shoshone, Arapaho, and English words related to water and the river corridor. This collection of information represents shared knowledge of an indigenous culture and a portion of the Shoshone and Arapaho indigenous knowledge systems. Three categories were used within the database to separate the different elements of culturally specific information:

- Cultural association with water and the river corridor
- Indigenous ecological knowledge of the river corridor
- Tribal landuse practices in the river corridor

EDITING AND CORRECTING RAW DATABASE OF "CULTURALLY SPECIFIC INFORMATION"

The preliminary database of culturally specific information (CSI) was edited to combine repetitive ideas and to define the culturally specific information that is important in the management of water, the

river corridor, and riparian ecosystems. Ideas that were repeated by numerous interviewees were included in the finalized database of culturally specific information. This is not to say that information that appears once in the database should be disregarded as culturally specific information, but attests to the fact that not all cultural knowledge is shared by all members of the community. A finalized database of culturally specific information was constructed from this analysis. The finalized database of culturally specific information was summarized into a set of statements describing the values and ideas that define the Shoshone and Arapaho world-view of water and the river corridor.

DEFINING THE SOCIAL, POLITICAL, AND ENVIRONMENTAL STATE OF THE WATERSHED

The environmental and social states of the watershed and the communities within the watershed were extracted from the results of interviews, background searches, and data collection efforts. A written description of the hydrological characteristic, and the environmental, social, and political constraints on water in the Wind River Indian Reservation and the Wind River Watershed is presented in Chapter 4.

DEFINING THE DECISION MAKING PROCESS APPLIED TO WATER AND RIVER CORRIDOR RESOURCES

The decision making process employed by the Shoshone and Arapaho Tribes to make water management decisions was derived from the analysis of CSI and the Wind River Water Code (WRWC). The WRWC was examined for the occurrence and application of culturally specific information. The ability of the Tribes to apply the code may be constrained by the operational reality of the basin. The Wyoming State Water Laws were examined for the occurrence of culturally specific elements of the indigenous knowledge base to determine whether the Tribes are constrained by the environmental demands on or the social state of the basin.

3.2.2 Search for 'Cultural Importance' in Wyoming Water Law

Wyoming State water laws (WY State Legislature, 1998) were analyzed for elements of the indigenous knowledge and the indigenous decision making process. This was accomplished analyzing the statutes for elements of the indigenous world-view. Areas of the statutes where CSI and the indigenous decision making process were apparent were documented. The areas where CSI has been ignored were also selected to illustrate where the integration of culturally specific information could be accomplished in the Wyoming statutes.

CHAPTER 4.0-RESULTS AND DISCUSSION

The interpretations of the ethnographic data collected and discussed in Chapter 3.0 (Methods and Analysis) are presented in this chapter. Outcomes of the analysis are presented within the chapter, as well as within numerous appendices.

4.1 INITIAL (RAW) DATABASE OF CULTURALLY SPECIFIC INFORMATION (CSI)

The preliminary database of CSI that was constructed from transcribed interviews with Shoshone and Arapaho Tribal members represents portions of the Shoshone and Arapaho indigenous knowledge systems (Table 1, Appendix B). This table represents the culturally specific information extracted from personal ethnographic interviews. A finalized database of the Shoshone and Arapaho indigenous knowledge (Table 4.1) was constructed by selecting the ideas that were repeated by numerous members of the Tribal community in the raw database.

4.2 FINALIZED DATABASE OF CSI AND COGNIZED MODEL

The information contained in the finalized database represents a set of statements describing the values and ideas that define the Shoshone and Arapaho world-view of water and the river corridor (Table 4.1). Some examples of the knowledge categories that were determined are: ceremonial use, ownership of water-not as a commodity, element of fasting, recognition of species loss. The ideas represented the individual statements made by Tribal members and catalogued within the raw database are presented within each knowledge category.

The CSI analyzed was found to include specific information associated with the use and management of both land, resources, water and the river corridor. The cognitive model created from the Shoshone and Arapaho world-view is represented by the Cultural Landscape Triad (CLT) (Figure 4.1). The CLT illustrates the view of water and the environment that the Shoshone and Arapaho Tribes maintain.

Table 4.1 Finalized Database of Eastern Shoshone and Northern Arapaho Culturally Specific Information (CSI) Associated with Water and the River Corridor

Cultural Association with Water and the River Corridor	Shoshone/Arapaho Ecological Knowledge of the River Corridor	Tribal Landuse and Management Practices in the River Corridor
CEREMONIAL SIGNIFICANCE: The use of water in tribal ceremony and custom (in the Sun Dance and Sweat Lodge ceremonies). Water is the main element of ceremony and takes on a high degree of significance. Water is viewed as sacred, which deepens the communal respect for it.	**UNDERSTANDING THE NEED FOR NATURAL VOLUMES OF FLOW:** The role of natural flow levels in the maintenance the river corridor environment is understood.	**OWNERSHIP OF WATER-NOT A COMMODITY:** The Arapaho have never recognized the ownership of water; it is shared equally by all living things. The higher powers make the decisions about its ownership and use! Water is looked at as a commodity by non-Indian people, but is seen as an elemental part of life within the Tribes. It is hard to put a value on life, and equally as hard to place a monetary value on water.
ELEMENT OF FASTING: When you are thirsty for water, you understand how precious it is, especially when you are thirsty of it for 3 days (or 6 days). That is when you truly understand that water is precious. During the Sun Dance fasting ceremony, the creators show us the value of water to our people and the environment through messages. In days past, the Tribes performed Sun Dance along the river. They would fast and pray, leaving gifts along the banks to thank the spirits for the water in the river and the plants along the banks.	**RECOGNITION OF SPECIES LOSS:** Ceremonial herbs are becoming more difficult to find along the river. It is harder to find the plants because of livestock. It is especially difficult to find those plants within the river corridor because of grazing practices.	**SUBSISTENCE LIVING:** Most Tribal member do not irrigate for commercial farm production, although, some grow hay or alfalfa for their family's livestock. Subsistence hunting and fishing in and around the reservation rivers and lakes still supports many Tribal families.
"THE WATER OF LIFE" In ceremony, water is always referred to as "the water of life". This exemplifies the connection we feel between aspects of nature, life, and water.	**APPLICATION OF THE HOLISTIC VIEW:** All the prophets know that all things are connected. By polluting the air, we affect our water, and by polluting the water, we affect all things. The purity of water is what generates life again.	**DAILY USE/ROLE OF WATER:** 30 years ago, the use of water in daily life still held a great amount of significance. We lived on the river and gave thanks to the rivers spirits for all the uses it provided us each day.

Cultural Association with Water and the River Corridor	Shoshone/Arapaho Ecological Knowledge of the River Corridor	Tribal Landuse and Management Practices in the River Corridor
PROPERTIES OF PURE WATER: Pure water, in its natural stream course is believed to contain spirits and life, but water from the tap and polluted water is void of that life and all spirits.	**SPECIFIC CLIMATE AND HABITAT KNOWLEDGE:** Knowledge of the growing seasons, annual occurrence, and habitat (location, elevation) of traditionally used plants is held by Indian Drs., medicine men, and Tribal members to whom the knowledge has been passed to by the elders. We know that there are plants that don't grow every year, but grow every two, four, or even 5 years. Traditional medicines are described in stories about how they are made and where they are found.	**CEREMONIAL USE:** The Tribes believe that the creator gave them cottonwood, which is always used in ceremonies. Sweet sage, juniper, and the cedar are collected from the river corridor and used in ceremony. Roots like sweet grass and peppermint are used for tea in ceremony, and reeds like slew grass, are burned in ceremony and used in the building of tepees. In the past, traditional leaders would catch and eat a fish before they performed a ceremony.
SPIRITUAL OFFERINGS: Ceremonial offerings were made to the river. Throughout the year and the seasons, people would watch for and collect items to be offered to the river spirits. They would go to an area by the river and burn things that smell good: sage, buffalo hide, grass, and rock gum. They would talk and pray to the river spirits at these gatherings and when they were done, they would throw the offerings into the river. It is used even in social dances, and some healers will use it as an offering in other ceremonies.	**KNOWLEDGE OF THE HYDROLOGIC CYCLE:** Consider the hydrologic cycle, we understand the cycle water goes through.	**MANAGEMENT THROUGH RESPECT FOR WATER & ALL THINGS THAT DERIVE LIFE FROM WATER (Holistic World View):** We respect the value of water to all things. We give thanks and offerings for what the earth provides us as a people. Before cutting trees that are used to put up lodges for Sun Dance, we offer prayers. When we put up the lodge, we offer prayers. We don't simply destroy elements of he natural world made by the creators.
WATER PROPHETS: In the past, we would perform ceremonies where we camped by the river for 4 days. Stories would be told and we would see water prophets, the learned people.	**ECOLOGICAL UNDERSTANDING DUE TO LONG TERM CONNECTION TO THE LANDSCAPE :** Our people have lived from this land for centuries, and our culture is culturally attached to that land in a holistic way. As a people, we developed an earthy approach and a connection to the earth and the water. Consequently, we developed a holistic understanding of it all.	**BOTANICAL KNOWLEDGE AND USE:** Members of the both Tribes hold a great deal of botanical knowledge associated with wild foods, tribal medicines and natural herbicides found in the river and the mountain ecosystems.

Cultural Association with Water and the River Corridor	Shoshone/Arapaho Ecological Knowledge of the River Corridor	Tribal Landuse and Management Practices in the River Corridor
MEDICINAL PROPERTIES OF WATER: Rainwater is caught in indented sandstone, and is used to heal laryngitis, sores, and sickness. It is also saved and used in ceremonies. For medical use, a patient drinks the rain water in conjunction with the medicine man's prayers. Medicine is believed to flow along the pure water of the river.		**MANAGED THROUGH CULTURAL CONNECTION TO PLACE:** Our people have stayed here day after day, month after month, years after years. We haven't moved from city to city as other cultures do. We have stayed here year after year. It is our homeland because of time and through treaties, and we must continue to protect it.
VALUE OF PURITY: Today our rivers and water are polluted, they are not pure, so the water spirits aren't available when you want to pray to them.		**NAMING AND CATEGORIZING THE LANDSCAPE:** The rivers and the mountains all have Shoshone names. The rivers were named according to the trees that grew on the banks. The elders named things by looking at them and appreciating them for their use, beauty, or spiritual value.
CEREMONIAL FISHING: Water, rivers, and fish are very important in our culture. The old timers went fishing for specific species of fish, sacred species, before they went into Sun Dance.		**MANAGEMENT THROUGH CULTURAL TABOOS:** We still apply taboos in our culture. There are taboos that prevent us from recording specific cultural information, and from harming the earth, the water, and the air. Many elders believe we have broken some of these taboos by writing down the Arapaho language and negotiating our water rights.
ROLE OF PEYOTE RELIGION: Water is used a great deal in the Peyote religion; we even have a water woman position.		**MAINTENANCE OF PURITY:** It is believed that everything that breathes the air and drinks the water has a spirit. In order to maintain the spirit of our people, we must protect the purity of our water and keep it running in our streams. It has always been part of our tradition to maintain the purity of the water.

Cultural Association with Water and the River Corridor	Shoshone/Arapaho Ecological Knowledge of the River Corridor	Tribal Landuse and Management Practices in the River Corridor
HOLY WATER: We use water to bless ourselves as holy water. It has a meaning that originates from our religion and differs from the way other religions use water.		**CONDUCTION OF WATER TROUGH SPECIES RELOCATION:** Tribal people used maintain things differently. Beavers were used to create water holdings in areas along the river were water reserves were needed.
ONE OF THE FOUR ELEMENTS FROM WHICH LIFE STEMS: Water, fire, the earth, and our lives, in our culture we believe all life was created through these four elements.		**CONSERVATION FOR FUTURE GENERATIONS:** The future use of land and water does not just represent recreation, back packing, or canoeing to Tribal people. It means clean water, clean land, and clean air for future generations and wildlife. We need to protect the water and the land. You really begin to respect and understand the value of the natural environment when you realized that the environment your culture is build upon is disappearing for the future generations.
TRADITIONAL STORIES: The importance of water has always been expressed in traditional stories. For example, there is a story about a tribesman who walks along the river, he is always along the river, and the important learning events in his life happen there, near the water.		

The CSI suggests that the Tribal community:

- Maintains a spiritual connection to water and the environment;
- Perceives water and the environment from a holistic viewpoint; and
- Values the role of water in the continued support of human and natural life.

These environmental values and views of the landscape were developed over centuries, through the relationship the Tribes have maintained with the landscape. The following sections provide specific examples of how the Shoshone and Arapaho world-view is built upon the elements of the CLT.

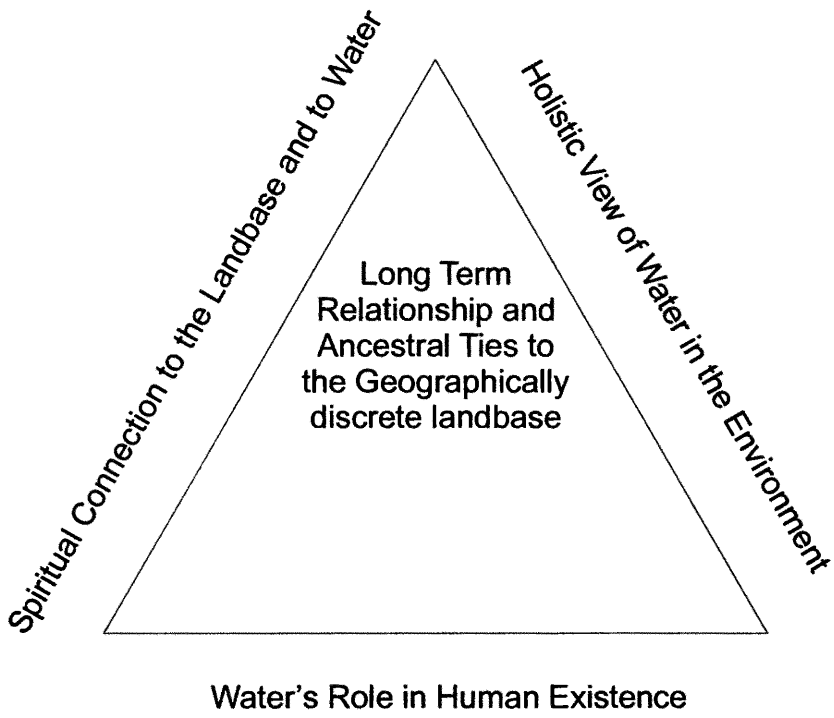

Fig. 4.1. Cultural Landscape Triad

4.2.1 HOLISTIC VIEW OF ENVIRONMENT

Interviews revealed that the Shoshone and Arapaho Tribes hold a holistic view of the environment, which emphasizes the inter-connectedness of all elements of the ecosystem. Water plays a central role within this view of the natural environment, and it is believed to carry life to all elements of the ecosystem ("Application of the Holistic View", Table 4.1). Tribal members noted that the prophets stressed

the connection between all parts of the natural world and the importance of pure water. According to the Shoshone and Arapahoe, pure water is water from the natural environment that is not polluted by human use or purified through water treatment (Goggles, Personal Interview, 1998; Shoyo, Personal Interview, 1998). Water was described as the generator of life in the ecosystem, the elemental component for ecosystem health, and the element that even the smallest creatures depend upon. The understanding of water's value in the ecosystem was stated by several Tribal members through discussions of the hydrologic cycle (Martel, Personal Interview, 1998; Ferris, Personal Interview, 1998). Several statements associated with the hydrologic cycle indicate the importance of water in the ecosystem, such as "consider the hydrologic cycle as far as the importance of water and it spin offs, you know that cycle water goes through. I would imagine that the water cleanses itself of pollutants at some point but eventually it is saturated with pollutants" (Ferris, Personal Interview, 1998).

The holistic view that the Tribal community shares was further exemplified by Tribal members who attributed the loss of species in the river corridor to a reduction in natural flows in the river corridor, which has been caused by non-Indian diversions and water quality problems. The loss of river corridor species that are used in ceremony, medical treatment, food, and the production of Tribal products, was noted by numerous Tribal members. Specific species names were not provided by Tribal members, although traditional names were mentioned. The knowledge of seasons of growth and the habitat of specific species known to traditional healers and those individuals who obtained this knowledge from their parents and grand parents, indicates a world-view that spans time and generations. Although statements associated with 'Specific Climate and Habitat Knowledge' and 'Botanical Knowledge and Use' were presented by many Tribal members, very few specifics were revealed to me. This lack of detail is attributed to the belief that this type of information is sacred and cannot be openly discussed outside of the Tribe. The information is protected by Tribal members and passed down orally to individuals in the next generation of the Tribal community.

4.2.2 Spiritual Connection to Land and Water

According to Shoshone and Arapaho Tribal lore, water is one of four elements from which life was created. Those elements are water, fire, earth and air. For instance, water is referred to as "the Water of Life" in a ceremonial setting. It is believed to house the spirits of the "water prophets" and to connect all

aspects of the natural world. The spiritual connection to the land and water forms the second vertices of the cultural landscape triad (Fig 4.1).

Tribal people stated that pure water and rainwater house the spirits of water prophets and carry medicinal powers, as one Tribal member stated, "medicine flows along the water" (White, Personal Interview, 1998). Furthermore, the Tribes believe that the life of the smallest creature in fresh water is generated through and able to survive in pure water (Maintenance of Purity, Table 4.1). They also feel that the healing capabilities, the spirits, and the life sustaining characteristics of water are lost when water is in a polluted form (Properties of Pure Water, Table 4.1). Tribal people understand that The 'Creator' provided the cottonwood tree, sweet sage, juniper, cedar and many other riparian species for use in ceremony, healing, and life (Tribal Landuse and Management Practices in the River Corridor: Ceremonial Use, Table 4.1). Polluted water and contamination are considered to affect the growth of the ceremonial species and all life that is supported in and around rivers and lakes.

The spiritual beliefs and legends that exist within the Tribal cultures are expressed in ceremonies that are related to seasonal change and other environment specific events. These ceremonies elicit the use of sacred waters and seasonal-specific plants, tree blossoms and herbs that have been passed down from spiritual elders.

4.2.3 HUMAN EXISTENCE

The final component of the Cultural Landscape Triad is human existence. Tribal people believe that water provides for life in the rivers and lakes, nurtures the wild game, and feeds the botanical life that support many Tribal families. Water in the landscape is understood to be essential to human existence. The Reservation provides the Tribal community with a source of subsistence living. Many Tribal families continue to live off their ancestral land base by practicing subsistence agriculture, ranching, hunting, and fishing.

4.3 HOW THE TRIBAL WORLD-VIEW INFLUENCES WATER RESOURCE DECISIONS

The set of information found to influence the managemente decisions made by the Wind River Tribes are represented by Figure 4.2. This figure illustrates how decisions associated with the management

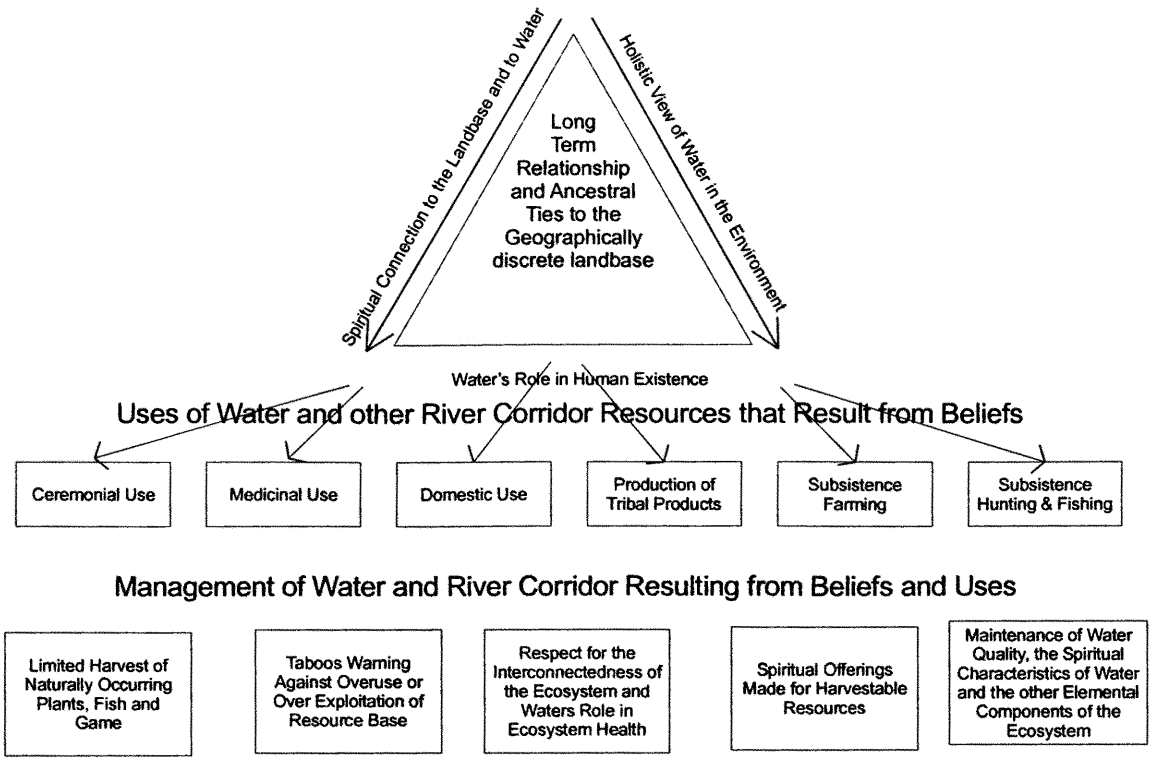

Fig. 4.2. Culturally Specific Information Influencing Tribal Decision Associated with Water and the River Corridor

of water and the river corridor are directed by tribal beliefs, cultural uses, and the tribal world-view. Tribal decisions relating to water resources focus on:

- Maintaining water and the river corridor environment for tribal uses;
- Protecting the livelihood of Tribal people that is directly associated with subsistence farming, ranching, hunting and fishing; and
- Preserving culturally related activities.

In the ethnographic interviews, Tribal members discussed management techniques that are a part of their knowledge base. Tribal member are taught culturally defined management practices throughout their lives via ceremony and practice. A number of the Tribal management techniques include:

1. Tribal people individually limit the amount of naturally occurring plants, fish, and game they harvest. In this way only what is needed is taken and amounts needed to maintain the population of that species are left.
2. Taboos are used as an effective means of limiting the use of many rare plants and fish for

ceremonial or medicinal use, by shaman or ceremonial elders.

Through these traditional management practice, the Shoshone and Arapaho people apply ancestral beliefs.

4.4 THE SOCIAL AND NATURAL CONSTRAINTS AFFECTING DECISIONS

Within the Wind River Basin, water is critical to the economic livelihood of the non-Indian farmers, ranchers, and towns (Riverton, Lander, Dubose). The need for water off the reservation is directly related to the economies of these communities. The Tribes are in direct competition with non-Indian people for the use of their Reserved Indian Water Rights, and for control over their unreserved rights. In this way, they are also in conflict with a societal group that does not share their world-view and whose need for water is centered around the agriculture and ranching industries.

The Tribes are aware that their ability to affect decisions associated with water and the river corridor will become more difficult as the demand for water in the Wind River Basin increases. The Tribes have attempted to ensure the control of water and the river corridor by creating the Wind River Water Code. The Water Code was created to ensure that decisions associated with water and the river corridors reflect their world-view and that those decisions are applied according to precedence set by the Tribes. The results and discussion that follow will explore whether the Wind River Water Code (Wind River Tribes, 1991) employs elements of the cognitive model of the Wind River Tribes' world-view to accomplish these tasks.

4.5 CULTURAL INFLUENCES ON THE WIND RIVER WATER CODE

The Wind River Water Code (Wind River Tribes, 1991)(WRWC) contains elements of CSI (Table 4.2). From this table, the decision making process for water resource management can be examined.

Record 1 of Table 4.2 § 11-8-I(A)(1) (Findings) and states that "the Tribes find that all of the Reservations natural resources are interconnected. They believe that water has cultural, spiritual and economic values that guide the appropriate use, management and protection of that resource. They also believe that these values also condition all water and land use activities in the watersheds and drainage basins of the Reservation" (Wind River Tribes, 1991). This statement defines the cultural association with water and the river corridor seen in the ceremonial significance of water, the 'water of life', as well as the

Table 4.2 Culturally Specific Citations Found within the Wind River Water Code (Wind River Tribes, 1991)

RECORD NUMBER	WRWC CITATION	CITATION QUOTATION	CULTURALLY SPECIFIC INFORMATION CITATION	ENVIRONMENTAL TRIAD COMPONENT
1	FINDINGS § 11-8-I(A)(1) PAGE 2	The Tribes find that *all of the Reservation's natural resources are interconnected.* They believe that water *has cultural, spiritual* and economic values that *guide the appropriate use, management and protection of that resource. They also believe that these values also condition all water and land use activities* in the watersheds and drainage basins of the Reservation.	• Ecological knowledge of river corridor: application of holistic world view • Cultural association with water & the river corridor: ceremonial significance, 'water of life', medicinal and spiritual qualities of water	• Holistic view of environment • Spiritual connection to land
2	FINDINGS § 11-8-I(A)(2) PAGE 2	The Tribes find that *surface and ground water are directly interconnected by the hydrologic cycle* of the region. They find that the Reservation, and therefore *water are unitary resources*, whether occurring as ground water, springs, mineral water, soil moisture, precipitation, percolating water, recharge, drainage waters, surface water, or otherwise.	• Ecological knowledge of river corridor: hydrologic cycle	• Holistic view of environment
3	FINDINGS § 11-8-I(A)(3) PAGE 2	The tribes recognize that *clean water is vital to the health and welfare of Reservation residents* and to the vitality of the Reservation economy. Because *resource uses may contribute to the degradation of water supply and quality*, it is necessary to protect the environmental quality and integrity of all surface and ground water.	• Cultural association with water & the river corridor: value of purity • Ecological knowledge of river corridor: application of holistic world view	• Spiritual connection to land • Holistic view of environment
4	PURPOSE § 11-8-I(C)(3) PAGE 3	To ensure that Reservation residents have *sufficient water for cultural, domestic, agricultural, stock, instream, and other uses,* and that the Tribes have sufficient water for Reservation economic development.	• Cultural association with water & the river corridor: ceremonial and medicinal needs • Ecological knowledge of river corridor: understanding of the role of natural flows • Tribal landuse: subsistence	• Spiritual connection to land • Holistic view of environment

RECORD NUMBER	WRWC CITATION	CITATION QUOTATION	CULTURALLY SPECIFIC INFORMATION CITATION	ENVIRONMENTAL TRIAD COMPONENT
			agriculture and ranching	• Human existence
5	PURPOSE § 11-8-I(C)(4) PAGE 3	To *conserve, manage and protect* reservation water for future uses by generations to come.	• Ecological knowledge: application of holistic world view • Tribal landuse and management: daily use, ceremonial use, maintenance of purity, respect for water	• Holistic view of environment • Human existence
6	PURPOSE § 11-8-I(C) (5) PAGE 4	To protect Reservation water from *over-appropriation, degradation, contamination, exploitation,* and to the quantity, *quality* or integrity of the water.	• Tribal landuse and management: conservation for future generations	• Human existence and holistic view of environment
7	PURPOSE § 11-8-I(C)(7) PAGE 4	To *maintain minimum perennial stream flows* and to promote *optimal recharge of aquifers* to supply beneficial uses.	• Ecological knowledge of river corridor: understanding of need for natural volumes of flow and knowledge of hydrologic cycle	• Holistic view of environment
8	BENEFICIAL USES § 11-8-I(E)(1)(F) PAGE 4	Instream Flow Use, including *instream flow for fisheries, wildlife, and pollution control, aesthetic and cultural purposes*	• Cultural association with water and river corridor: ceremonial and medicinal beliefs an d use • Ecological knowledge: application of holistic world view • Tribal landuse and management: subsistence hunting, fishing and production	• Spiritual connection to land • Holistic view of environment • Human existence
9	BENEFICIAL USES § 11-8-I(E) (1)(K) PAGE 4	*Cultural Use*	• Cultural association with water and the river corridor: ceremonial significance, 'water of life', medicinal and spiritual qualities of water;	• Spiritual connection to land
10	BENEFICIAL USES § 11-8-I(E)(1)(L) PAGE 4	*Religious Use*	• Cultural association with water and the river corridor: role in Peyote religion, holy water, ceremonial significance, 'water of life', spiritual qualities of water;	• Spiritual connection to land
11	POLICIES	*Surface water use will be adjusted for varying*	• Ecological knowledge of water & the	• Holistic view of

RECORD NUMBER	WRWC CITATION	CITATION QUOTATION	CULTURALLY SPECIFIC INFORMATION CITATION	ENVIRONMENTAL TRIAD COMPONENT
	§ 11-8-I(F) (2) PAGE 5	*water conditions each year,* and overall water use allocation decisions will be guided by the declaration of drought, normal, and surplus hydrologic conditions that require different water management strategies. *Water development decisions will recognize variability and will consider alternative sources of supply, should dry conditions prevail.*	river corridor: understanding need for natural volumes of flow; knowledge of hydrologic cycle	environment
12	POLICIES § 11-8-I(F)(3) PAGE 5	Ground water use will be granted by the overall condition of each aquifer system, the expected long-term yields, and the *cumulative impacts* of existing and proposed uses on ground and surface water degradation.	• Ecological knowledge of water & the river corridor: application of holistic world view, interconnectedness of elements of the ecosystem	• Holistic view of environment
13	POLICIES § 11-8-I(F)(4) PAGE 5	The planning and development of water and land resources will *safeguard against surface and ground water degradation.*	• Tribal landuse and management: conservation for future use	• Human existence
14	POLICIES § 11-8-I(F)(6) PAGE 5	Land use decisions involving or *significantly affecting a stream bank, bed, channel, or water storage* facility s*hall seek to maintain and enhance the fishery and wildlife resource.*	• Tribal landuse and management: management through respect of water and all things that derive life from it or • Ecological knowledge of water & river corridor: application of holistic world view	• Holistic view of environment • Human existence
15	POLICIES § 11-8-I(F)(8) PAGE 5	All land, water and other resource strategies, decisions, or regulations shall *consider the potential effect on all Reservation natural resources.*	• Ecological knowledge of water & river corridor: application of holistic world view	• Holistic view of environment
16	POLICIES § 11-8-I(F)(9) PAGE 5	Allocation decisions are subject to periodic consideration, review for their net effect on trust resources and values, and may require adjustment of existing uses to *protect trust where appropriate.*	• Tribal landuse and management: conservation for future generations • Cultural association with water and the river corridor: ceremonial, spiritual and medicinal value and use	• Human existence • Spiritual connection to land

Record Number	WRWC Citation	Citation Quotation	Culturally Specific Information Citation	Environmental Triad Component
17	Establishment of the Office of the TWE Duties § 11-8-II(B)(3) page 7	Regulations of Reservation recognize *water as being the lifeblood of the community and critical to the conservation and enhancement of its resources*, the Tribal Water Engineer (TWE) shall evenhandedly guard all the interests involved in carrying out the duties and authorities of his office.	• Tribal land use and management: subsistence living • Ecological knowledge of water and the river corridor: application of holistic world view	• Human existence • Holistic view of environment
18	Establishment of the Office of the TWE Duties § 11-8-II(B)(4)(a)(ii) and (iii) page 7	(ii) ..to monitor water use, *water quality*, and diversions. (iii) ..to control activities that *adversely affect water quality* and quantity	• Tribal landuse and management: maintenance of purity	• Spiritual connection to land • Holistic view of environment
19	Establishment of the Office of the TWE Duties § 11-8-II(B)(4)(b)(v) page 8	To recommend designation of surface and ground water regions on the Reservation as *critical management areas and to propose specialized provisions for management* within those regions.	• Cultural association with water and river corridor: sacred areas, important for medicinal plant collection • Tribal landuse and management: subsistence fishing and hunting grounds	• Spiritual connection to land • Human existence
20	Permit System § 11-8-III(B)(3) page 11	Instream Flow Permit: Grants the rights to the Tribes *to maintain specified instream flows and/or lake levels in reaches of or for entire streams or reservoirs on the Reservation.*	• Ecological knowledge of river corridor: understanding of need for natural volumes of flow	• Holistic view of environment
21	Permit System § 11-8-III(F)(1)(a)(v) page 14	No person shall willfully take, alter or damage treaty-based water quality or water rights.	• Tribal landuse and management practices in river corridor: maintenance of purity	• Holistic view of environment

medicinal and spiritual qualities of water. This citation clearly acknowledges the culturally specific world-view of the Shoshone and Arapaho Tribes and the Tribes' desire to incorporate these cultural beliefs into their water and river corridor management schemes.

Record 8 of Table 4.2 cites § 11-8-I(E)(1)(f) (Beneficial Uses) and states that "Instream Flow Use, including instream flow for fisheries, wildlife, and pollution control, aesthetic and cultural purposes" (Wind River Tribes, 1991) is considered a beneficial use within the Reservation. The designation of instream flow as a beneficial use for cultural use infers a cultural association with water and river corridor that represents the 'spiritual connection to land' of the Tribe. This citation also reflects Tribal ecological knowledge since it emphasizes a desire to maintain instream flows for the health of fisheries and wildlife. The desire to maintain fisheries and wildlife population may also be related to Tribal landuse and management practices, which provide Tribal members with the means for subsistence hunting, fishing, and production. The Tribes' desire to make the maintenance of instream flows a beneficial use represents all three categories of the Tribal world-view (holistic view of environment, spiritual connection to land, and human existence) and provides an example of a Tribal management policy that incorporates CSI.

Records 9 and 10 of Table 4.2 specifically designate cultural and religious uses of water as beneficial uses under the Wind River Water Code, as cited in § 11-8-I(E) (1)(k) and § 11-8-I(E) (1)(l) (Beneficial Uses). In this way, the Tribes hope to guarantee their ability to reserve Tribal waters for culturally specific and religious uses that may otherwise be denied by the State of Wyoming. By claiming cultural and religious uses of water as beneficial, the Tribes directly apply the "spiritual connection to land" component of the Tribal world-view to the Wind River Water Code.

Record 15 of Table 4.2 § 11-8-I(F)(8) (Policies) states that "all land, water and other resource strategies, decisions, or regulations shall consider the potential effect on all Reservation natural resources" (Wind River Tribes, 1991). This citation emphasizes the interconnectedness to the greater ecosystem.

The CSI that was identified in the Wind River Water Code (Wind River Tribes, 1991) is used to define the decision making process that the Shoshone and Arapaho Tribes employ in water management decisions. Since the Water Code directs decisions associated with water and the river corridor, it provides a model for such a decision making process.

4.6 THE SHOSHONE AND ARAPAHO DECISION MAKING PROCESS

The Wind River Water Code (Wind River Tribes, 1991)(WRWC) outlines the legal criteria for making water resource decisions. The formal construction of the code (Wind River Tribes, 1991) was necessary because the social and economic constraints within the Wind River Basin limit the ability of the Tribes to freely manage their reserved Indian water rights. The Wind River water code is the Federally recognized law of the Tribal Nation. Therefore, it should be considered, in conjunction with Federal and State water statues, by the State Water Engineer when determining the use of Tribally owned water rights. The Tribal Water Engineer enforces the WRWC to protect the Tribes' Reserved Indian Water Rights and to ensure the State Water Engineer honors the code when considering Tribal requests for action associated with their water.

Water resource decisions are formally made by Tribes, through the application of the Wind River Water Code (Figure 4.3). The Tribal decision making process associated with water allocation are heavily based upon the water balance of the basin. The use of a surplus and drought criteria in the decision making process does not differ from Euro-American methodology for water allocation. New water rights are not allocated to individuals when drought conditions occur (or are forecasted) in the basin. The beneficial uses in the WRWC differs from those associated with Wyoming State statutes since they are based upon CSI For example, religious and spiritual uses of water are considered beneficial, as are uses that contribute to the continued health of river corridor ecosystems, such as instream flow. These differences in the acceptable application of water rights result in disagreement between the State and the Tribes when the State denies the Tribes the right to apply water to the uses outlined in the WRWC.

The Wind River Water Code (Wind River Tribes, 1991) is applied when determining whether water permits and licenses should be granted to Tribal members and to determine the allowable applications of Reserved Indian Water Right. The quantification of reserved Indian water rights is based upon a standard of "practically irrigatable acreage" within the reservation boundaries (Checchio and Colby, 1993, pg. 12). The Tribes' reserved Indian water rights are the most senior water rights in the Wind River Basin. Since reserved rights are not controlled by state and Federal water law, they retain their validity and seniority regardless of whether the Tribes have put the water to beneficial use.

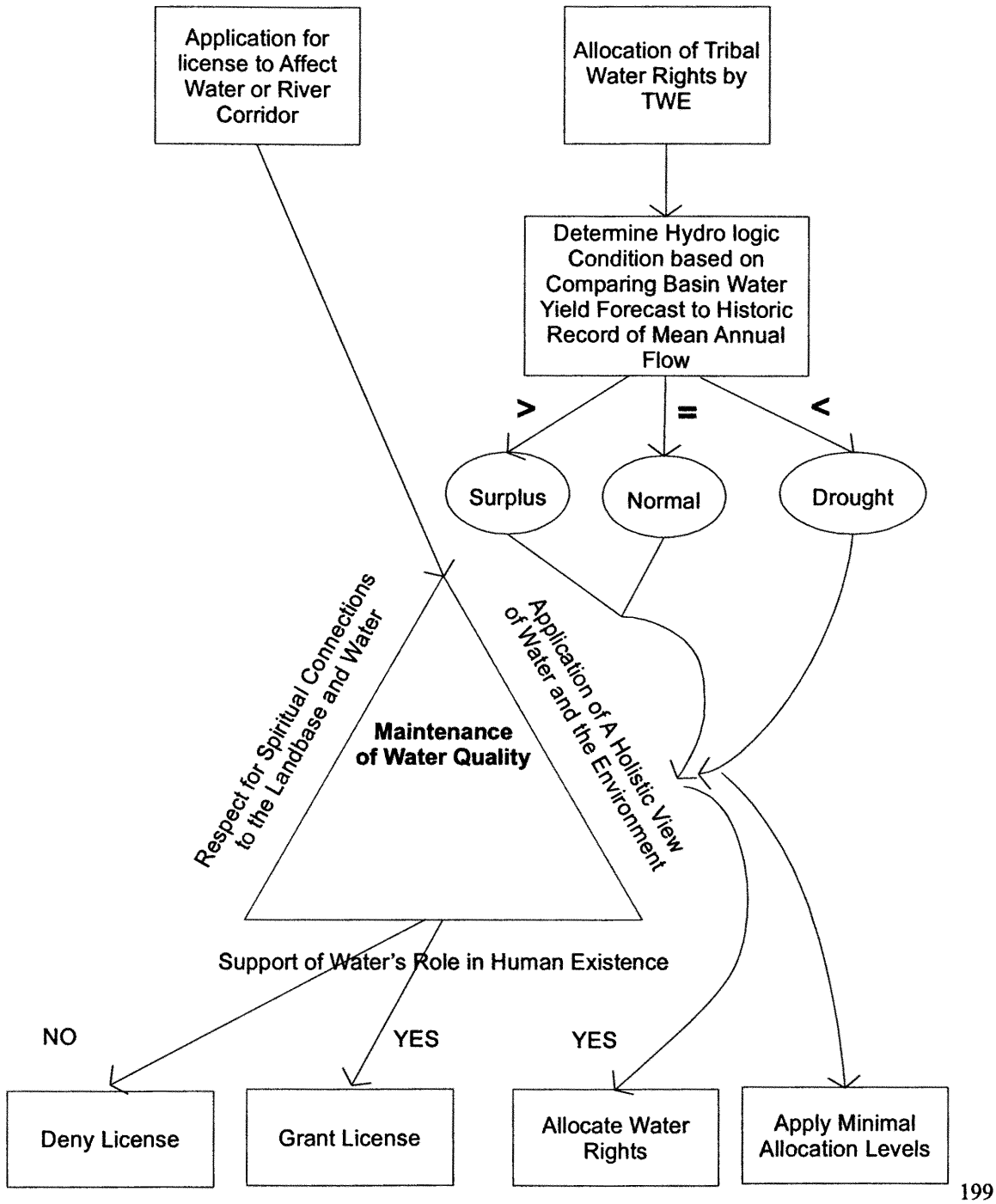

Fig. 4.3. Decision making Process Associated with the Wind River Water Code (Wind River Tribes, 1991)

Section 11-8-III of the Wind River Water Code (Wind River Tribes, 1991)(*Appendix C*) outlines the formal procedures that is followed by the Tribal water engineer to grant a water permit or a license. The process is applied when the Wind River Tribal Water Engineer reviews each permit application and recommends approval or denial to the Wind River Water Board, based upon his/her findings (Figure 4.3). Every decision made by the Board must include facts collected in the field and historical documentation, which justify that decision. Decisions must be consistent with tribal water and landuse laws and are based upon the assumption that the request being made is feasible.

The decision making processes are also applied in the administration of Tribal water rights. Tribal water rights are administered (*WRWC §11-8-V)* by the Tribal Water Engineer (TWE) according to water supply conditions. Water supply conditions are expressed in the water supply forecast prepared by the office of the Tribal Water Engineer. The forecast declares the existence of surplus, normal, and drought conditions, and the approximate extent of time in which these conditions will exist each year. The forecasted hydrologic condition is based upon a comparison with the mean annual flow of the watershed for the available historic period (1940 to date). Because of widely varying hydrologic conditions, the TWE may designate one portion of the Reservation in surplus and another in drought condition. If drought conditions apply, such that not enough water exists to satisfy water rights on a priority basis, the diversion rate shall be set according to the specific demands in relation to overall supply. The board may set temporary use priorities, which reflect needs outlined in the Findings and Purpose section of the WRWC.

Although the permitting and allocation procedures outlined by the WRWC apply Euro-American hydrological science and water law principals to determine the feasibility of management actions, they incorporate elements of the cognitive model. The effect of hydrologically feasible management and allocation actions were analyzed to determine whether they adhere to the principals of the cognitive model. The schematic of the indigenous decision making process (Figure 4.3) demonstrates how elements of the Tribal world-view are applied within the decision making process. This diagram shows that after the water balance criteria have been employed, the TWE determines whether the desired use of water is consistent with the Tribally specific needs and beliefs. The TWE accomplishes this by referring to the beneficial uses and purpose section of the Wind River Water Code. In this way the TWE ensures the protection of the culturally defined uses of water and river corridor resources. Despite the desire of the Tribe to apply the

decision making process, some obstacles remain in the application of the Water Code and the Tribal decision making process.

Obstacles to Application of Tribal Decision making process

To date, the Tribes have been unable to effectively apply their decision making process to stream reaches within the Reservation and for Tribal water rights. Although Tribal water rights are held in trust by the Tribes, they are ultimately controlled by the state of Wyoming. This control stems from a 1992 Wyoming Supreme Court decision, which ruled that the Tribal government did not have blanket jurisdiction over non-Indian water users on the reservation and that the state had some jurisdiction over water rights exercised on the reservation (Checchio and Colby, 1993). This ruling, coupled with the 1988 WY Supreme Court ruling, which states that reserved water rights do not extend to groundwater and denied reserved water rights for instream flow and other Tribal purposes (Checchio and Colby, 1993), limits the Tribes ability to manage their water resources according to the standards set out by the Wind River Water Code. The allotment of the Wind River Tribes' water rights is controlled by the State Water Engineer. This means that the application of the Wind River Tribes' reserved water rights must be granted by the State, under the consideration of the State statutes. The Tribes' desire to apply water rights to beneficial uses not justifiable under State water laws is subject to State approval. State oversight in water management prevents independent Tribal control of Tribal water and river corridor interests within the reservation.

The Big Horn III, instream flow case exemplifies this finding. In April 1990, the Tribes dedicated a portion of their 1868 Reserved Indian Water Right to maintain instream flow in a segment of the Big Wind River that is controlled by non-Indian interests (Checchio and Colby, 1993). The water rights were enacted by the Tribes to protect fisheries, as well as stream channel and riparian corridor habitat, water quality, cultural and spiritual needs, and subsistence hunting and fishing (Checchio and Colby, 1993). Under the McCarran Amendment (1952), stream adjudications associated with Indian reserved water rights could be heard in state courts. The Wyoming Supreme Court denied the Wind River Tribes this right in the Big Horn III decision. If the Tribes' were given the right to enact their reserved rights, they would be the first rights to be allotted in a basin that is already over-appropriated. The enactment of the reserved rights could leave junior water right holders without water during normal and drought years. This decision was

based upon the state's desire to only apply water to beneficial uses that are specified in the Wyoming Water Statues; instream flow use is not one of the beneficial uses outlined in the State statutes.

4.7 CSI IN THE WYOMING STATE WATER STATUES

The Wyoming State water statutes (WY State Legislature, 1998) were examined to determine whether CSI and elements of the Tribal decision making process are present. Specific areas, where culturally specific information and the Tribal decision making process have been disregarded, are also discussed.

4.7.1 TRIBAL DECISION MAKING PROCESS IN WYOMING WATER STATUTES

Title 41 of the Wyoming State statutes identifies the purpose, and stipulates the organizational and regulatory details of the State's water statutes (WY State Legislature, 1998). Title 41 directs the management of water resources in Wyoming. Chapter 2, Article 11 (41-2-1101) discusses the State funding available for rehabilitation or expansion of existing water delivery systems and water storage projects within the Wind River Indian Reservation. Other than this mention of the Reservation, there are no specific occurrences of Eastern Shoshone and Northern Arapaho culturally specific information.

The statements that outline the purpose and function of Wyoming water law assume a homogenous perspective from the dominant cultural group, who are Euro-Americans. This statement is supported by the fact that Tribally defined beneficial uses are disregarded within the State statutes. It is also supported by the unwillingness of the office of the State water engineer to consider the Tribal Water Code in state decisions. As a result, the Shoshone and Arapaho people are assumed to share the environmental perspective of the Euro-American population. Sections of Title 41 are cited in the following paragraphs to illustrate how alternative perspective of the Tribal communities has been ignored.

THE 'PURPOSE' OF STREAM PRESERVATION: THE EXCLUSION OF TRIBAL PEOPLE

According to §41-2-101 of Wyoming State law, "stream preservation feasibility studies are authorized to determine methods and criteria for preserving the scenic and recreational quality of Wyoming's rivers and streams" (§41-2-101). §41-2-102 also states that the duties of the committee assigned to perform such studies include the completion of "a preliminary survey to define the character, quality, recreational, scenic, historical, aesthetic, fish and wildlife potential, and any other value to be

considered in preserving streams for public use and benefit" (§41-2-102). It should be noted that the committee is made up of 14 members; no tribal representatives are specified in this statute. If Tribal people were represented in this committee, CSI could be presented under the "any other value to be considered in preserving streams for public use and benefit" statement.

The purpose of stream preservation, as defined by the statute, is to preserve the scenic and recreational quality of Wyoming streams. There is no mention of preserving stream to support cultural needs, beliefs, or subsistence lifestyles. The assumption embedded in the statute is that the needs of all of Wyoming's population are met through the preservation of the scenic and recreational quality of Wyoming's rivers. In this way, the statutes assume that the population exhibits similar values, beliefs and needs with respect to water and river corridors. This is illustrated by the use of the term 'values'. Although values are mentioned in the statute, the cultural values that characterize Tribal associations with water and the river corridor are omitted.

CSI has been neglected within this and other areas of Title 41. In addition, the use of the word 'historical' in this statute is misleading. Within the lexicon of Euro-American resource management, the term 'historical' is presumed to encapsulate cultural information. It is assumed to represent the historical and cultural context of cultural groups when in fact it is a Euro-American interpretation of history and culture (Ruppert, 1996). 'Historical' and cultural resources have historically reflected Euro-American expansion into the western United States and the Euro-American viewpoint of Native American culture. It does not represent the perspectives of individual Native American Tribes or their role in the history of the United States.

Defining and Prioritizing Beneficial Use: The Exclusion of Culturally Specific Use

According to Chapter 3, Article 1 of Title 41, "a water right is a right to use the water of the state" (§41-3-101). Water is regarded as property of the State and its intrinsic value is seen in its ability to contribute to economic gain through agricultural, ranching, and other means. Therefore, water is viewed as a commodity that is owned by the state and administered to the people of the State to be put to "beneficial use". The notion of water as a commodity is associated with the dominance over nature world-view

maintained by Euro-American cultures, and thereby disregards culturally specific uses designated as

beneficial within the Wind River Water Code (Wind River Tribes, 1991)(WRWC).

Beneficial uses are administered according to their order of importance. The prioritization of these are outlined in the Wyoming water statutes. They are prioritized by the State in the following manner:

> "water for drinking purposes for both man and beast; water for municipal purposes; water for the use of steam engines and for general railway use, water for culinary, laundry, bathing, refrigerating (including manufacture of ice), for steam and hot water heating plants, and steam power plants; and industrial purposes. The use of water for irrigation shall be superior and preferred to any use where water turbines or impulse water wheels are installed for power purposes; provided, however, that the preferred use of steam power plants and industrial purposes herein granted shall not be construed to give the right of condemnation" (§41-3-102).

As stated above, the beneficial use of water entails the removal of water from the stream channel for consumptive, industrial and agricultural use. Although the Tribes list domestic, municipal, and industrial uses of water as beneficial, they also include instream flow, cultural, religious, and pollution control as beneficial uses (Table 4.3). These uses are not represented in the Wyoming water statues. The assumption made in Article 1 of Chapter 3, that the appropriate uses of water for all people of Wyoming are represented within the State's definitions of beneficial uses is incorrect.

THE PURPOSE OF INSTREAM FLOWS: THE EXCLUSION OF TRIBAL CONTRIBUTIONS

According to Title 41, Chapter 3, Article 10, the purpose of instream flow is "to maintain or improve existing fisheries, and are declared a beneficial use of water on a case by case basis by the state engineer, if such use does not impair or diminish the rights of any other appropriator in Wyoming" (§41-3-1001). This statement defines the need to maintain the natural flow of water in the stream channel in terms of fisheries. The finalized culturally specific information database (Table 4.1) specifies numerous cultural uses of the river corridor ecosystem, which require the maintenance of a minimum instream flow level: the maintenance of fisheries for subsistence fishing; the maintenance of riparian plant species for medicinal and cultural purposes; and the maintenance of flow for ceremonial practices associated with the river. Defining the purpose of instream flow solely as fisheries maintenance disregards tribal priorities associated with the river corridor.

Table 4.3 Beneficial Uses of Water of Wyoming and the Wind River Tribes (* The italicized beneficial uses are representative of CSI and the Tribal world-view)

Beneficial Uses Listed in Title 41 of WY State Water Law (§41-3-102)	**Beneficial Uses Listed in Wind River Water Code (§11-8-I(E))**
Drinking, Man and Beast	Domestic Use
Steam Engines and General Railway	Municipal Use
Domestic Use	Agricultural Use
Steam and Hot Water Heating Plants	Stock Water Use
Industrial Uses	Industrial Use
Irrigation	*Instream Flow Use*
	Mineral Resource Development
	Water Storage, Marketing and Transfer
	Ground Water Recharge
	Recreational Use
	Cultural Use
	Religious Use
	Pollution Control
	Resource Development
	Hydropower Generation

THE EXCLUSION OF CULTURALLY SPECIFIC INFORMATION

The examples from the Wyoming State Water Laws illustrate impedances to the inclusion of CSI in Wyoming water management practices. These examples also illustrate the lack of consideration given to Native Americans in Euro-American water and river corridor management. They demonstrate the lack of employment of CSI in water law, and the void of culturally specific information in the management schemes that arise from those laws. The ability of the Shoshone and Arapaho tribes to administer their Reserved Indian Water Rights according to their culturally specific needs and beliefs depends on the

incorporation of culturally specific information within Wyoming water management agendas.

The Tribes of the Wind River Indian Reservation have attempted to manage their water resources and river corridors according to their Water Code. This attempt has been thwarted because their water rights have been and continue to be administered according to State Laws. Until the State statutes incorporate or reflect the CSI of different cultural groups, decisions associated with water resource management will be predicated on the Euro-American world-view.

4.7.2 Discussion of Integration

CSI needs to be incorporated into the areas of the State statutes that disregard the indigenous decision making process. This is necessary to provide the Tribes with their Federally granted rights to manage their natural resources as a sovereign nation and to introduce alternate ways of managing water resources. It is not known whether the introduction of CSI into Euro-American water laws will provide a better way of managing water resources and river corridor ecosystems, but it may provide alternate avenues for their management that are beneficial. This task can only be accomplished by altering the societal constraints within the operational reality of the watershed. This may be accomplished by fostering lines of communication and trust between the Tribes and the large watershed community.

CHAPTER 5.0-CONCLUSION

The methodology applied in this thesis outlines a procedure for defining and categorizing culturally specific information associated with a cultural group, and determining whether that information is included in Euro-American water management schemes. The lack of consideration for CSI indicates disregard for indigenous knowledge within river corridor management decisions, which result from the application of Title 41 of the WY Water State Law. The Wind River Water Code (Wind River Tribes, 1991) integrates culturally specific information into a management code composed in a Euro-American, legal format, proving that the integration of two different world-views is possible. The Tribes accomplished this integration by incorporating elements of the Tribal world-view into the findings, purpose, beneficial uses, and policies chapters of the Wind River Water Code.

5.1 PROCEDURAL MODEL FOR INTEGRATION OF CULTURALLY SPECIFIC INFORMATION

The research was premised on the idea that culturally specific information may prove useful in providing sustainable resource management solutions. It is important to remember that culturally specific information remains the intellectual property of the group from which it arises. That cultural group should be included in determining the management schemes that apply culturally specific information, to insure its proper use and due respect.

The methodology used in this project was applied according to the following sequence of actions (Figure 5.1):

1. Define culturally specific information

2. Determine the area of resource management for which culturally specific information will be solicited. (In this case study, culturally specific information associated with water and river corridor was solicited from Shoshone and Arapaho people who identified their inability to manage their water resources

according to culturally specific needs and beliefs.)

3. Work within the community to establish relationships with individual members involved in this area of resource management, building liaison relationships within the cultural group.

4. Select a sample population for interviews, which will provide the culturally specific information being sought, through the advice of cultural liaison. It is necessary to select a sample population from a discrete group within the community, known to be 'experts' in the area of interest. This selection cannot be accomplished without the help of community members.

5. Interview members of the discrete sample population, soliciting information that characterizes the cultural view of the environment and defines their decision making process.

6. Extract and catalogue culturally specific information from the interviews.

7. Construct a cognized model of the cultural world-view from the culturally specific information.

8. Define the environmental, social and political constraints associated with the environment to be managed. This definition is the operational reality of the environment in question.

9. Return to the community with the model for review and comment.

10. Observe the application of culturally specific information to resource management within the cultural group. In this case study the Tribal water code was analyzed for the occurrence of culturally specific information in order to define the decision making process used within the community. If no written code for resource management exists, discussion focusing on how the particular environment of interest is controlled must be conducted, and the implementation of management decisions within Tribal government or by individuals should be observed.

11. Define the decision making process that is derived from culturally specific information and applied by the cultural group to make resource management decisions.

12. Analyze the Euro-American resource management schemes associated with the environment in questions for elements of the cognized model and the decision making process that were defined through anthropological research techniques

13. Identify areas where the disregard of culturally specific information has led to, or could result in, inequitable resource management decisions in the environment in question

14. Identify the elements of the cognized model or indigenous decision making process that need to be

integrated into those portions of the Euro-American management scheme to result in culturally equitable management decisions. For instance, definition of beneficial use employed in Title 41 of the Wyoming State Law needs to incorporate the uses that the Tribe has defined as beneficial in their Water Code. These uses should be given equal consideration with all other uses in areas where Tribal people reside. This will ensure that their culturally specific needs are met along with the need of other water users. It may also introduce alternate perspective on watershed management into the Euro-American approach.

Once the methodology has been implemented, the opportunity to apply integrated management practices may be presented to the indigenous and Euro-American communities. Implementation of these practices should be performed as a controlled experiment, in which observations and measurements are recorded. Analysis and observation procedures should be continued for a period of record that may help to determine the success of the integrated methodology in achieving sustainable and useful resource management practices.

This procedural model provides a framework for integrating culturally specific information within the Euro-American resource management scheme. The National Park Service is beginning to explore the inclusion of culturally specific information and the Tribal people in determining cultural resource management schemes within National Parks (Ruppert, 1996). This type of research needs to be explored by water and natural resource management professionals. The incorporation of cultural sensitivity into Euro-American resource management strategies may prove valuable by introducing alternate ways of managing and sustaining valuable resources. Additional research is necessary to determine how successful the integration of CSI is at achieving specific resource management goals, such as sustainable management of ecosystem components. The collection of detailed information associated with the element of the ecosystem to be managed would be required.

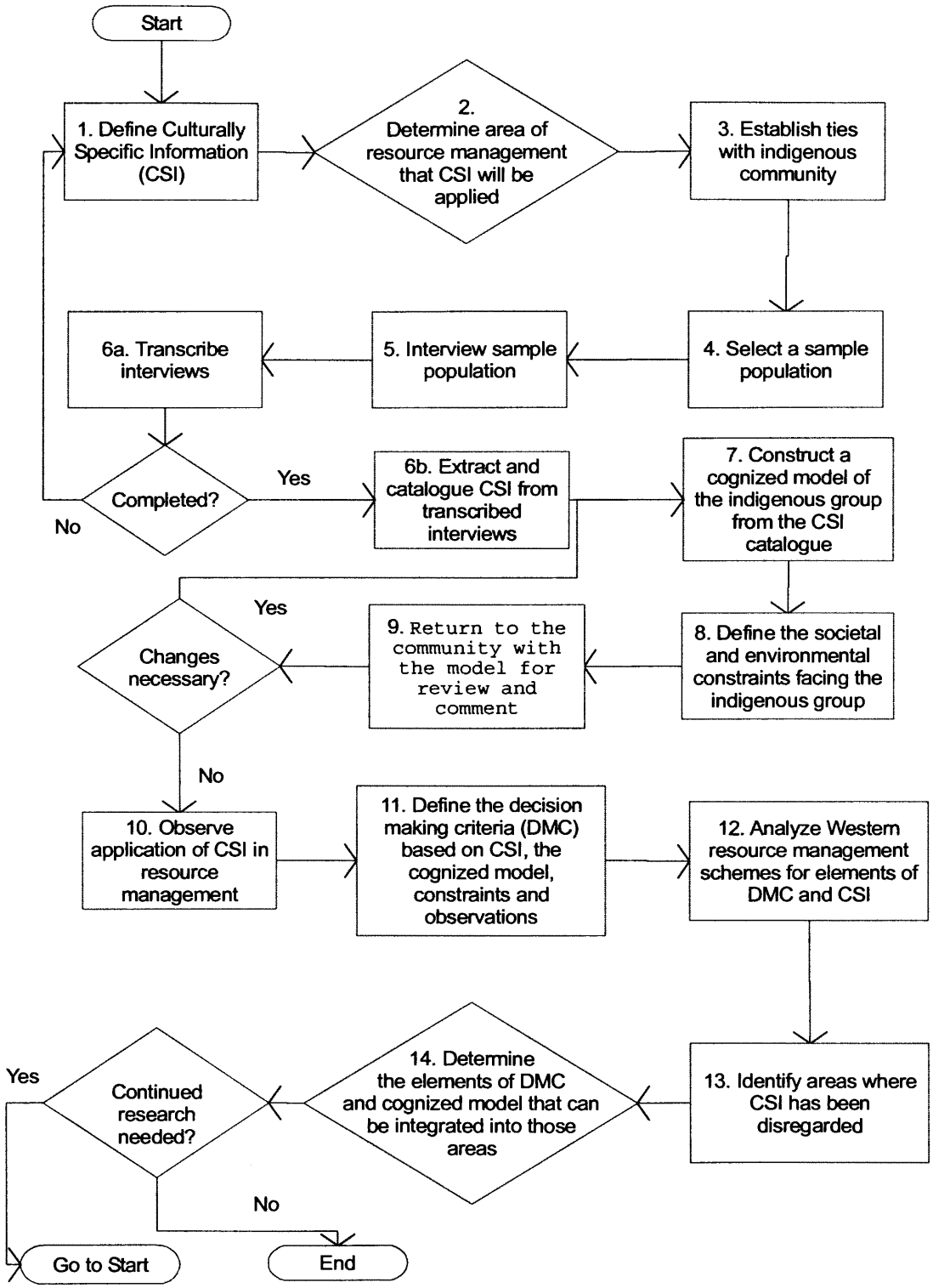

Fig. 5.1. Process model for integrating culturally specific information into Euro-American resource management schemes

5.2 CONCLUDING REMARKS

This research has shown that a cognized model can provide an avenue for describing knowledge about an environment, summarizing beliefs concerning the environment, and conveying the essence of a world-view. Tribal knowledge and beliefs associated with water and the river corridors of the Wind River Reservation are reflected in the finalized culturally specific information database (Table 4.1) and within the Cultural Landscape Triad.

The designation of beneficial uses that include cultural and religious uses, and the use of water for instream flow and pollution control represent the components of the Tribal world-view. The decision to include instream flow and pollution control in the beneficial uses of the Wind River Water Code (Wind River Tribes, 1991) also represent a choice to manage water holistically, so that pure water and natural flow levels will maintain the health of the river corridor ecosystems and protect the culturally specific values inherent in those systems.

Although the water right allocation and license process steps do not greatly differ from State or Federally owned processes, the manner in which the Tribal Water Engineer considers water uses are predicated upon the beneficial uses declared by the Tribes. The Tribal world-view principals, the holistic view of water in the environment, a spiritual connection to water and the reservation environment, and a responsibility to protect Tribal existence on the reservation, are embedded in the decision making process. These criteria differ from the criteria applied by the state of Wyoming. The decision making process is applied within the water code to determine whether water permits and licenses should be granted to an individual based on the beneficial uses specified within the water code. The Wind River Water Code (Wind River Tribes, 1991) ensures that decisions associated with water and the river corridors of the Reservation are applied according to the precedence set by the Tribes, if the code is applied. Unfortunately, this is only true within the reservation and is limited by the Wyoming State Water Laws, which have been shown to exclude culturally specific information.

The Tribes are unable to apply the decision making process represented in the Wind River Water Code (Wind River Tribes, 1991) to stream reaches and water rights located within the Reservation boundaries, held in trust and controlled by the Bureau of Reclamation or the state of Wyoming. This reflects the effects of the operational reality of the basin on the Tribes ability to control their resources. State oversight of water in the Wind River Basin prevents the protection of Tribal water and river corridor

interests within the reservation. The ability of the Tribes to apply the Water Code and affect decisions associated with water and the river corridor will become more difficult as the demands for water in the Wind River Basin increases.

The Wyoming State Water Laws neglect the decision making process of the Wind River Indian Tribes. The Wyoming State Engineer administers the water rights of the Tribes. Presently, the statutes ignore CSI that is in conflict with Euro-American derived values associated with water resources. This task can only be accomplished by altering the constraints within the operational reality of the watershed. This may be accomplished by fostering lines of communication and trust between the Tribes and the greater watershed community.

This thesis has illustrated a methodology for defining and categorizing culturally specific information associated with a cultural group, and determining whether that information is included in Euro-American water management schemes. The research that led to this methodology has exposed the lack of consideration for culturally specific information in the Wyoming water laws, upon which water and river corridor management decisions are predicated. The Wind River Water Code (Wind River Tribes, 1991) successfully integrates culturally specific information into a management code composed in Euro-American legal statutes, proving that the integration of two different world-views is possible.

LITERATURE CITED

Akimichi, T. (1978). The Ecological Aspect of Lau (Solomon Islands) Ethnoichthyology. *Journal of Polynesian Society*, 87: 301-326.

Akimichi, T. (1981). Perceptions and Function: Traditional Resource Management in Three Pacific Islands. *Resource Management and Optimization*, 1(4): 361-378.

Alcorn, J. B. (1980). Huastec Mayan Ethnobotany. University of Texas Press. Austin, TX.

Aliu, Y. O. and Mohammed, A. N. (1990). Indigenous Research: A Vital Link Between Science, Technology and Development. *Discovery and Innovation*, 2(1): 7-10.

Aragon, D. (1998). Personal Interview 3-14-98. Member of the Shoshone Tribe of the Wind River Native American Reservation and Coordinator of the Wind River Quality Council.

Auble, G.T., Friedman, J. M., Scott, M. L. (1994). Relating Riparian Vegetation to Present and Future Stream Flow. *Ecological Applications*, 4(3): 544-554.

Barlett, P. F. (1977). The Structure of Decision making in Paso. *American Ethnologist,*. 4(2): 285-308.

Berlin, B. (1992). *Ethnobiological Classification: Principles of Categorization.* Princeton University Press. Princeton, NJ.

Bodley, J. H. (1990). *Victims of Progress, 3rd Edition.* Mayfield Publishing. Mountain View, CA.

Brown, F., and Stone, T. (1989). Using Satellite Photography for the Grassroots Development in Amazonia. *Cultural Survival Quarterly*, 13(1).

Brush, S. B. (1993). Indigenous Knowledge of Biological Resources and Intellectual Property Rights: The Role of Anthropology. *American Anthropology,* 95: 653-686.

Burton, L. (1991). *American Indian Water Rights and the Limits of the Law.* University Press of Kansas. Lawrence, Kansas.

Cashman, K. (1991). Systems of Knowledge as Systems of Domination: The Limitations of Established Meaning. *Agriculture and Human Values*, Winter-Spring: 49-58.

Checchio, E. and Colby, B. (1993). *Indian Water Rights: Negotiating the Future.* The University of Arizona Press, Tucson, AZ.

Clarke, W. C. (1990). Learning from the Past: Traditional Knowledge and Sustainable Development. *The Contemporary Pacific,* 2(2): 233-252.

Clyde, S.E. (1989). Adapting to the Changing Demand for Water Use Through Continued Refinement of the Prior Appropriation Doctrine: An Alternative Approach to Wholesale Reallocation. *Natural Resources Journal*, 29(2): 435-455.

Collins, G. (1998). Personal Interview 6-2-98. Wind River Indian Reservation Tribal Water Engineer.

Cordell, J. (1993). *Who Owns the Land? Indigenous Involvement in Australian Protected Areas in Protecting Indigenous People in Protected Areas: The Law of the Mother.* Sierra Club Books. San Francisco, CA.

Cunningham, A. B. (1991). Indigenous Knowledge and Biodiversity: Global Commons or Regional Heritage? *Cultural Survival Quarterly*, 15(3): 4-8.

DeWalt, B. R. (1994). Using Indigenous Knowledge to Improve Agriculture and Natural Resource Management. *Human Organization,* 53(2): 123-131.

Davey, S. (1993). *Creative Communities: Planning and Co-managing Protected Areas*

in Protecting Indigenous People in Protected Areas in The Law of the Mother. Sierra Club Books. San Francisco, CA.
Eastern Shoshone Tribe, (1998). *Memorandum of Understanding between the Eastern Shoshone Tribe and CSU.* Eastern Shoshone Tribe, WY.
Engel, J. R. (1990). *Ethics of Environment and Development: Global Challenge, International Response.* Belhaven Press, London.
Ferris, David (1998). Personal Interview 12-4-98. Member of the Arapaho Tribe of the Wind River Native American Reservation
Gadgil et. al. (1991). Traditional Resource Management Systems. *Resource Management and Optimization,* 8(3-4): 127-141.
Galdwin, C. H. (1980). *A Theory of Real Life Choice: Applications to Agricultural Decision Making.* In Barlett, P. E. (ed.). Agricultural Decision-Making: Anthropological Contributions to Rural Development. Academic Press, NY.
Goggles, Patrick (1998). Personal Interview 6-26-98. Member of the Arapaho Tribe of the Wind River Native American Reservation
Griffiths, T. (1990). History and Natural History: Conservation Movements in Conflict? *Occasional Paper: Australian Academy of the Humanities,* 11: 87-109.
Horton, R. (1967). *On African Traditional Thought and Euro-American Science.* Indianapolis: Bobbs-Merrill.
Huffman, J. L(1992). An Exploratory Essay on Native Americans and Environmentalism. *University of Colorado Law Review,* 63(4): 901-920.
Johnson, M. (1992). *Lore: Capturing Traditional Environmental Knowledge.* Dene Cultural Institute. Ottawa, Ont.
King, S. R., et. al. (1996). Biological Diversity, Indigenous Knowledge, Drug Discovery and Intellectual Property Rights: Creating Reciprocity and Maintaining Relationships. *Journal of Ethnopharmacology,* 51: 45-57.
Lalonde, A. and Morin-Labatut, Gisele (1995). Indigenous Knowledge, Innovation and Sustainable Development: An Information Sciences Perspective. *Scandinavian Journal of Development Alternatives,* 14(1/2): 206-221.
Lewis, D. R. (1995). Native Americans and the Environment: A Survey of Twentieth Century Issues. *American Indian Quarterly,* 19(5): 423-450.
Martel, W. (1998). Personal Interview 3-13-98. Member of the Arapaho Tribe of the Wind River Native American Reservation
Melnick, R.Z., (1980). Cultural Landscapes: An Emerging Concern for Resource Management. *Cultural Resources Management Bulletin,* Vol. 3, No. 1, National Park Service Washington D.C.
McNeely, J. A. (1993). *People and Protected Areas: Partners in Prosperity in Protecting Indigenous People in Protected Areas in The Law of the Mother.* Sierra Club Books. San Francisco, CA.
Nazarea-Sandoval, V.D. (1991). Ethnoagronomy and Ethnogastronomy: On Indigenous Typology and Use of Biological Resources. *Agriculture and Human Values,* Winter-Spring-8(1-2): 121-131.
Parker, P. L. (1993). Traditional Cultural Properties: What You Do And How We Think. *Cultural Resources Management Bulletin,* 3(1). National Park Service, Washington D.C.
Parker, P. L. and King, T. F. (1993). *Guidelines for Evaluating and Documenting Traditional Cultural Properties.* National Register Bulletin 38, National Park Service, Interagency Resource Division, Washington D.C.
Pinkham, A. V. (1996). A Traditional American Indian Perspective on Land Use Management. *Landscape and Urban Planning,* 36: 93-101.
Rappaport, Roy (1979). *On Cognized Models. In R. Rappaport. Ecology, Meaning and Religion.* North Atlantic Books, California.
Redford, K.H. (1991). The Ecologically Noble Savage. *Cultural Survival Quarterly,* 15(1): 46-48.
Roht-Arriaza, N. (1996). Of Seeds and Shamans. *Michigan Journal of International*

Law, 17: 918-965.
Ruppert, D. (1996). Intellectual Property Rights and Environmental Planning. *Landscape and Urban Planning*, 36: 117-123.
Schoenhoft, D. M. (1993). *The Barefoot Expert: The Interface of Computerized Knowledge Systems and Indigenous knowledge systems.* Greenwood Press, London.
Shoyo, Harrison (1998). Personal Interview 12-3-98. Shoshone Elder of the Wind River Native American Reservation
Srivastava, N. K., Gupta, A. K. (1995). Ecological Investigation of Varuna River Corridor: A Case Study. *Acta Botanica India*, 23: 39-42.
Sterling, S. R. (1990). *Towards an Ecological World-view in (J. Engel and J. Engel eds) Ethics of Environment and Development: Global Challenge and International Response.* Belhaven Press, London: 77-86.
Tallbull, B., Deaver, S. and LaPoint, H. (1996). A New Way to Study Cultural Landscapes: The Blue Earth Hills Assessment. *Landscape and Urban Planning,* 36: 125-133.
The State Historical Society of Colorado, (1959). *The Indians of Colorado.* The State Historical Society of Colorado, Denver.
Tisdell, C. A. (1995). Issues in Biodiversity Conservation Including the Role of Local Communities. *Environmental Conservation,* 22(3): 216-222.
Tversky, Amos (1972). Elimination by Aspects: A Theory of Choice. *Psychology Review,* 79(4): 281-291.
University of WY (1996). Water Quality Study of the Big Wind River Below Bull Lake Dam. Unpublished Study sponsored by the Wind River Quality Council.
USGS Web Site (1999), Gauging Station Data.
Webster (1984). *Webster's II New Riverside University Dictionary.* The Riverside Publishing Company, Boston, MA.
White, R. (1985). Introduction to American Indians and the Environment. *Environmental Review*, 9: 101-103.
White, Theresa (1998). Personal Interview 7-11-98. Arapaho Elder of the Wind River Native American Reservation
Wilkinson, C. F., (1989). The American West. University Press of Colorado. Niwot, Colorado.
Wilkinson, C. F. (1990). Values and Euro-American Water: A History of The Dominant Ideas. Natural Resources Law Center Occasional Papers Series: Euro-American Water Policy Project Discussion Series No. 1.
Wind River Tribes (1991). Wind River Water Code. Wind River Statues, Chapter 8.
World Commission on Environment and Development (1987). *Our Common Future.* Oxford Press, Oxford.
WY Division of Fish and Wildlife (WYDS) (1993). The Effects of Increased Sedimentation on Fisheries Habitat in the Big Wind River Below Bull Lake Dam. Unpublished Study sponsored by the Wind River Quality Council.
Wyoming State Legislature (1998), Title 41 (Water) of the Wyoming State Statutes.
Yakubu, J. M. (1994). Integration of Indigenous Thought and Practice with Science and Technology: A Case Study of Ghana. International Journal of Science Education, 16(3): 343-360

APPENDICES

APPENDIX A

TRANSCRIBED INTERVIEWS OF SAMPLE POPULATION

DATE: 12/3/98

SUBJECT: Stanford Addison (Arapaho) Sandy Addison (Arapaho)

TRIBAL ROLE: Traditional Healer

AGE: 40 (Stanford) 33 (Sandy)

ADDRESS:

PHONE NUMBER:

QUESTION:

- What is/was the use and need for water in the environment to the Shoshone and Arapaho people, both in everyday life and in cultural practices?
- Were/are is the biologically diverse riparian corridors and stream channels culturally significant to the Tribes? How?
- What are your thoughts on the use of water and traditional views of water? Cultural significance of water?

a. I will explain first how it is important in the sweat lodge. In the sweat lodge it is considered the gift of life, that is what it represents. Everything that breathes the air and drinks the water we believe has a spirit and in order to maintain the spirit of the people we need to keep the water pure and to keep it here. I hear a lot of different things about how different tribes look at how precious water is to us as a whole, not just as individuals, but everyone depends on it and requires it. I hear my Mom and Uncles talk about the different way of maintaining things even way back when, if they needed water at a certain place and if it was getting too dry or barren, they would trap a couple beavers and put them in that area and let the beavers do it. Now a days they put a dam or dig ditches to get the water where they want it.

I think if we keep it as close to nature and keep it as natural as we can, then it will have a better chance of purifying itself. However, right now the way things are going with pesticides, the water does not get a chance to run its

natural course, and the pollutants build up so we do need to deal with ways to remove the chemicals and pollutants. In the old days, they would get the water out of the river for sweat lodge but now we use water from the tap because we don't know if the water is pure.

Right now, I think education would be the most important thing to try to maintain the purity of the water. Getting these people to understand what the consequences up ahead. The acid rain in the mountains is bad. Last time we went up to the mountains, I met a guy who fished up there for 30 years and he only caught one fish this last time. Maybe somewhere, sometimes the creator has a way of taking care of things himself. Just as if these kids when they don't listen you have to be harsh on them so that they understand that what they are doing it wrong. The way the creator looks at us, we are like kids ourselves and maybe it is kind of his way of correcting us or trying to show us something that we are overlooking. We will find out!

Because all these things tie together and that water is the most important thing to all life, religion, your livelihood, all things are connected to that water. That is why when we are in that lodge we offer some back to the earth before we take any ourselves. That is so we know we will reap it, it is like restoring it back to the earth.

I mentioned that I truly felt the spirit of the community, the support amongst the tribal people and the power of cleansing in the sweat lodge. I went on to say that that is uncommon off the reservation where a lack of community exists: There are many people who don't understand the Indians' world and that is something that is blocking our water. People don't get the sense of community and communal support that Indian share amongst one and other because they never try to share or take part in our lives, they want us to take part in theirs but they don't want to meet us half way. There is a lack of communication between parties, the county and even the State. We will never settle anything to where both parties are satisfied until we start communicating.

In addition, you know that sweet lodge, when you were in there. You don't just cleanse your body and your mind, you cleanse your spirit. Because many times people hurt their bodies, and they also hurt their spirit for doing things they shouldn't be doing. When you go in that lodge you cleanse your spirit of that, as soon as you find that sincerity in your heart and you start to try to live it in your everyday life, because we are all humans, we all make mistakes.

The creator gave us these ways, we are catholic too, and he gave us the choice to decide which way we wanted to pray to him. In addition, I found out that to me, personally, it is the sweat lodge; it does me a lot of good. My life expectancy was 12 years and it has been 20 since I was paralyzed. I got into an auto accident when there was a heard of horses on the road...I couldn't miss them. The truck rolled over and I guess it grabbed part my clothing and threw me over and it happened on Halloween night. I was 20 years old.

A lot of times we don't see ourselves because a lot of times it is hard to take a look at yourself and see what you do wrong in your everyday life. When you stop or something happens that is serious and life threatening, that is like a warning for you. A lot of us don't even pick it up by changing our everyday life, instead we go right back to the same way that got us into that situation. Each time we push it away or put it off, it gets bigger and bigger until we learn that lesson that the creator wants us to know.

However, you know this water, fire, the earth, and our lives ourselves, to us that is how life was created through all the four elements. There is some other stuff that would be helpful, but I can't be the one to tell you because it is traditional. It should be one of our spiritual elders that tells you.

Thoughts on recording specific traditional knowledge of medicinal plants and plant usage?

You know all these plants and everything we use for medicine and stuff like that, people who use them in different ceremonies, their grandparents handed them down to them so they are kind of recorded already. To me, I think that they should record them because there are many tribal people who are denying their identity. They don't want to take part in this knowledge. Somewhere down the line, we are going to depend on this knowledge because it is from the creator. He didn't give it to us for us to throw away. When you use these medicines, it is the spirit that is in them, that is why we have to take through a sweat before we use them. It is to put the spirit of that medicine in there so that way the healing power is stronger. If you get the plants and whatever is used, you aren't desecrating anything because the spirit isn't in there yet. They are just there in nature like anything else. So I kind of think that they should record it. We are (tribal people) are just the keepers of this knowledge, it is for the whole people and the creator gave us this knowledge for everybody who needs the help. In addition, not everybody can put the spirit into

these medicines; the creator appoints those that can.

SANDY: I kind of think that if it were to be recorded that certain people will miss use that knowledge. I think that the tribal elders should be more observant of people to see who has a kind heart before they pass that knowledge along. Our tribe is so big and right now it seems like people are more concerned about the financial part of life. However, even at that it is for themselves, when tribal people are elected, they forget about everyone who got them in, they are only looking out for themselves. To some extent, there is trouble with the councils representing the peoples ideas. Have you spoken with anyone on the water council. Is he a red man?

Stream flow:

Now with all these farmer, in the past they never had dams and when they needed water they use the beaver technique to conduct the water and or make it go where they wanted it too. I remember a long time ago this water, this river right down here used to just be a little creek in the summer time for at least 2 months and then it would come back up again by itself. It kind of maintained itself and even through some fish died because of low water, they all were restored again, naturally. I think that is more of a problem when the flow comes back in with so many chemicals and pesticides; it stops the life from regenerating.

Is the area around the river more important than other areas for the collection of medicinal plants or things that are used in ceremony?

Yes, there is for some of these plants that they use, like the cotton wood tree needs a lot of water to keep growing and there are some other plants that I don't know the technical names of. Then there are some other medicines that grow out in the hills where the only water is rainfall and they still grow. In addition, it seems to me that they don't grow in the same place each year, they move. There is this one plant that is for your kidneys and bladder and I found a whole bunch of it up here a couple years ago and I went back over there this year to go and get some and there wasn't any, instead I found some down here. So, it grew close to the river too and I thought it only grew up in the hills. It is harder to find the plants because of livestock and they don't let them grow to its full growth, they eat

um up before they grow. It is hard to find some of the plants, especially right along the water. The area along the water is where it is hard to find them because everybody wants their animals right to close to water.
Can you think of anything else that you would place significance on, to say that water is important for these reason to you as a tribal people?

Yes, traditionally it is; water is important to our ways, to our Sun Dance. When you go and fast, you realize how precious and important it is to our everyday life. We take so many things for granted and never give him thanks and water is way up on the list. Because when you go out there and fast, you only crave food for a little while but that craving for water never leaves, it is with you all the way, until you come back. You fast for as long as you make a vow for where the longest is 3 to 7 days, but I haven't heard of anyone going out for 7 days. I guess they used to but now 5 days is about the tops. There are different places to fast and you usually go by yourself. Sometimes there are more that go out, but you are each in your own little lodges. It has always been told, even in our traditional stories and water is always part of it. Like they tell this story about this guy who walks along the river and he is always along the river. Everything that happens in his everyday life is near water. It has always been part of our tradition to maintain the purity of the water. Because the purity of the water is what generates that life again and if it is not pure, even the smallest creatures depend on that purity and they are part of everything too.
SANDY: Do you think there is a difference between the way women and men view things traditionally, is there a woman's point of view versus a mans point of view or in ceremony?
I learned a lot from my mother in law, she tells me things. What I know and what I have come to respect is that the man is the head of the household and then the children and then me. We are mans complement. With traditional ways, it is mostly man that go into Sun Dance although women do to but they don' t participate too much in the inside. We women go to sweat and purity meetings but we don't really speak out although we express ourselves at times in different ceremonies. We are respected in that way because we carry life. In everyday life, the husband is served first and then the children and then us, that is the way it goes. As for tradition, we do participate. If my

husband went into Sun Dance then I would cook for him. In sweat, I sit next to him and sing when he needs help singing.

n. The way I see it, there is still respect of tradition that we hold on to in our live and that is what gives us the understanding to one and other and allows us to maintain both worlds that we live in. This is because there is our traditional world and the white world. In order to combine both of them it takes a lot of strategy, a lot of thought and a lot of planning. It also takes a lot of comforting because you know we all make mistakes. Lately it seems like most families only maintain the traditional side. Lately it seems that as soon as the ceremony is over, they don't have to do that anymore and can go back right back to what they were doing. That is why they loose the ability to communicate because you have to practice what you preach and it is hard to keep a balance between good and bad. It seems that they can't get the understanding of even though you do good there is going to be some bad and that is what keeps us walking the straight line.

My grandfather told me that there was one true religion and when I read the bible I thought, I wonder if he got it from here but he didn't know how to read. He was getting the information from somewhere else; maybe it was passed down to him. They kind of prepared us for the changes we are still going through now and they said there is one true church. The way that I see it we are all coming together and all these different churches will come together too. There are many people that aren't Indians that are interested in seeing the outcome of these ceremonies. Then they can't believe anymore, how can something so good be looked at and criticized? More and more people will become aware and everything will come together, it is just that patience we have to learn too.

Water is looked at as a commodity by non-Indian people and we look at it as part of life. It is hard to put a value on life so it is even harder to put a value on water. Some councilors from El Paso Texas were going to come up with a friend of mine, he asked them if they would be interested in a sweat and they asked them how much does he charge, it is up to you if you make an offering. I guess they got discouraged and they said that it must not be that good if it isn't worth anything and if you can't put a price on it.

DATE: 3-14-98

SUBJECT: Don Aragon (Shoshone)

AGE:

ADDRESS: [redacted]

[redacted]

PHONE NUMBER: [redacted]

QUESTION:

- What is/was the use and need for water in the environment to the Shoshone and Arapaho people, both in everyday life and in cultural practices?
- Were/are the biologically diverse riparian corridors and stream channels culturally significant to the Tribes? How?

TRIBAL WATER QUALITY STANDARDS

On 4/1/98 the tribes opted to adopt the states (WY) water quality standards (not yet adopted by EPA)

NPDES permits on the reservation are currently state permits but the tribes are preparing the permits according to Federal standards in order to remove them from the states oversight.

Don sit on the EPA Environmental Justice Programs regional board

IRRIGATION IN THE MISSOURI RIVER BASIN AND BIG WIND WATERSHED

USGS conducted a study of water use by irrigators and concluded that irrigators could get by with 1/3 of the water volume that is historically used by water right holders (CONTACT USGS WY)

TRADITIONAL LIFE AND THE ROLE OF WATER

Historically the Shoshone people were digger Indians, prior to the coming of the horse.

Following domestication of horses, the tribe was able to cover a greater extent of land and became more of a nomadic tribe

ROLE OF TRADITION IN LAND MANAGEMENT

On the reservation, no ground disturbance occurs without a cultural and archeological survey by tribal elders

The walk overs that do occur could incorporate more intense viewing

There is a great deal of botanical knowledge of the ecosystem associated with wild foods, tribal medicines and natural herbicides

RECORDING OF TRADITIONAL KNOWLEDGE IN AN ORAL CULTURE

Important to begin working with tribal elders and traditional healers to record the pieces of traditional knowledge that still exist

A great deal of information has been lost and this makes the need for recording indigenous knowledge that much greater

GIS would be an excellent way to manage the information and would enable the tribes to control the information

The information may contain sacred ideas and knowledge which are to be recorded for tribal use only

The permission of the Joint Business Councils and the ceremonial elders if you were to pursue the recording of indigenous information.

DATE: 12/4/98

SUBJECT: David Ferris (Shoshone)

AGE: 55

ADDRESS: [redacted]

[redacted]

PHONE NUMBER: [redacted]

QUESTION:

- What is/was the use and need for water in the environment to the Shoshone and Arapaho people, both in everyday life and in cultural practices?
- Were/are the biologically diverse riparian corridors and stream channels culturally significant to the Tribes? How?
- How was water envisioned in the environment, what was its role, how was it included in tradition and what was its importance in general to the Shoshone people?
- In addition, are there cultural significance of the river corridor area, the importance of riparian plants and the importance of the area to cultural practice?
- Are there cultural reasons for maintaining steam flow?

This is just my view. I guess you have to consider the hydrologic cycle as far as the importance of water and all the spin offs, you know that cycle water goes through. I would imagine that the water cleanses itself of pollutants at some point but eventually it gets saturated.

As far as culturally, it is always in stories, you know the water. In addition, you know it is important for the creatures and the fish. In all ceremonies it is used, it is used as blessed water. It is almost like holy water I guess. It is used in all ceremonies. I am familiar with Sun Dance, which is a specific ceremony from when I took part, that is what I am talking from. You go through a series of 3 days or 4 days, what ever is designated, without water and food

and then you go through these phases of your lack of water and food. When the fasting is over, then that is when the water is brought in at a certain time and it is blessed and mixed with a certain clay to quench your thirst. You think about that when you are in there as a participant and you learn not to take everything for granted and you appreciate everything, and it is not just water but everything that it effects and everything that is tied to it. It is a kind of a cleansing ceremony anyway; it is done yearly. Other areas where it is used, it is used even in social dances, some people will use it as an offering in other ceremonies, I can't really go into other ones because I don't really know them all, but just from what I hear there is a big role for water. In some different ceremonies, there is a person who is called a waterman; I don't really know anything about it but just from hearing from other people. There are many things that it is used for in our lives.

Then you have to think about herbs and that type of stuff and it wouldn't be anything if there were no water. It all ties back to water, so it is all kind of in the big picture.

As far as the tribe, they use it in all these different ways to survive. This is a certain portion of the land and we were lucky enough to get the headwaters and it is kind of like we are in control and don't know it. In addition, there are many responsibilities with that, with today's technologies, advancements because everything is being polluted too. So there is that part of it now. Part of it now should be the tribal focus, and I am glad that they did form this environmental committee to focus on this.

I am not a high priest, so I don't anything about some of those experiences.

I think we have to be more vocal on it now. It is like we are being stalled; so that we don't use it and that is when the people will have to start dividing it up and they don't want to come to that point. Therefore, it is kind of like we are just put off. But, in how many years is it going to change, in how many years is it going to get worse, in how many years is it going to be everything through the barrel? I don't know. Because water is going to get that important. Therefore, it is kind of hard to think about. You know, how are we going to protect it, how is everybody going to be looking at water then? Now if you through all these tribes and work with different and find out all these different settlements, none of them apply yet, so all the water is there. Therefore, what is going to happen at the

time that they are applied, there are going to be many shortages. War I guess.

Differences between how the tribe uses water and how the agricultural communities use water?

To me it is obvious, you look at how they dewater our rivers and how everything is set up not to our advantage, and lets just put it that way. Even the irrigation systems, there was money set aside way back when, 100 million dollars to do a certain thing and 4 million go into our system and the non Indians get the bulk of the money. That already tells you what the situation is. As far as tribal, I don't think that they have the financial and knowledge to set up like the non-Indians agricultural systems. Because there is land available, there is land that you could farm and make productive but you also have to have the delivery systems in place. Our systems (canals), we have systems but you could say that 50 on up percent is leakage because we don't have them lined with concrete, we have the wood head gates that deteriorate. You can go on and on with these problems but that is what you are faced with already. Therefore, it is kind of, and back when it was forced on...they told us we were farmers. And then being Riverton, Lander, Wyoming and Freemont County, it is ingrained as far as agriculture, that that is what you have to be, that is what this is, what it is for is the cow. Run the numbers and look at the figures and you see that agriculture is down as far as the economic output but the most water as far as water, goes to agriculture.

The water is taken for granted. The rivers run out here, it is clear and clean and it has fish in it. You really don' t realize that it starts getting chocolaty and chocolaty as it hits Riverton an then all that stuff settles into the Bousin and it is filling up with dirt. In addition, I think that it is not; it is not like "don't have it". It is not ingrained in the Indian to be a farmer, folks never taught them to do this. It could be in the stock market, it could be at one time. I think that you could market water. I think that if we looked at the numbers to see who is using all the water and who doesn't, I think that would tell the tribes what to do there. The most beneficial would be to sell it because not everyone is a farmer yet everyone has a water right. Now if you sold it to a casino or a riverboat to make sure they float, well that is not too far off from what we believe. Now there is that little stuff of selling water through a bottle, you know that is another option, but that is a little enterprise

It goes back to the culture, do you treat it as money. I think most tribal people don't see it as money, and that would

be the only way, selling the water rights to another tribe or a power plant. It is hard to sell the water because it is part of Mother Earth. The same with the land. With European culture, every square inch of land is owned and accounted for. But you have to think in those terms, as far as the future...what are we going to build here, what will our water requirements be, what kind of population will we have, how much water per day will they need, how many communities are there? You know, those kind of calculations has to be understood to decide what we do with our water in the next how many years. We are lucky enough to get our water off the mountains where it is pristine and we shouldn't be polluting it, although by the time it leaves here, it has about every kind of chemical in it. Reclamation Lake is kind of a bowl, it sits there and is stagnant and there are already mutant things in there and there are already mutant things in there, it is kind of like a dead lake, nothing can live unless they live on chemicals. Yes, they have caught some strange creatures out of there that are evidence. There is still run off that goes further down, goes into Riverton and who keeps tabs on Riverton? You know they have meet processing plants and all that kind of stuff down there but nobody knows what they are dumping out. For sure, they don't want the tribes to handle how many NPDSs they have. They would have to start towing the line. That is what it comes down to. Water runs at 500 acre foot a year, that is supposedly our water, but that is roughly a third of the capacity but who control the other 2/3, which is being used for farming or whatever. You know that o tribal council has been run by the cattlemen's association since it began because that is what was here. Well, lets not get into that. The beneficial ratio for agriculture, you put in so much water but you don't get much back through agriculture. There are other areas where you could utilize water at a higher benefit cost ratio. For example, if you were to create a fishery you would get some benefit back through revenue and jobs. I am just saying that there are other areas where water can be used other than agriculture.

I just hope that we never let go. We get a lot of stuff from the state making different kinds of statements that things don't apply, etc. but they haven't heard from the tribes, but they don't know! They just edge in, as much as they can take, like if we can hunt on the Reservation then lets do it. Everything they can take little by little. The tribes didn't really respond and should of and didn't. I think it all has to come to light, everything, not

only water. We have school systems that are put in by people that are not even from the reservation, we can't even do our own school boundaries. Environmental, we need to put in a code, we have some ordinances, I think we have a class 1 designation; I'd have to find it because back in the 80s we had people on the council who passed it. It is there but it just isn't implemented.

To summarize, it is very important. Education is the key as far as letting people know that what is out, what is available. For instance, lottees don't know that they have two sets of rights, they have a tribal water right and a lottee water right and people don't know that difference. You have to start having information meetings on water so that people can become aware about what is out there and has been taken for granted for a long time.

Education of non-Indian people to Indian ways I think it wouldn't hurt. We are in a State that is republican and conservative. It is a prejudice community. When I was a kid I used to see signs that said no dogs or Indians allowed and now they have just taken the sign down and the attitude is just the same. I feel the prejudice every time I go to Lander or Riverton, every time, every day, and every year. It has gotten to a point where we are as bad if not worse than them. We learned how to be more prejudice, more ignorant, more jealous. I guess we are blending in that way. There is a degree of color, if you are darker you may have a harder time; if you are lighter you can kind of get away with it. Even within the reservation and other tribes, color has meaning.

As a child we live on the river, hunting and fishing for food and we learned to appreciate the mountains and the purity of the surroundings and the water. When students go off to University, it is a whole different world out there. There are kids that are affected and you can't even realize how bad. I guess you just have to learn to live with prejudice.

Back in the Indian wars people didn't really kill, they just really played with people and the more you could play with people, the bigger you were. It wasn't really about killing. Then you go in the service and you are taught to kill people who are saying "same, same" because of the color of our skin and the skin of Vietnamese people.

All and all I think that all people that are tied to the earth really value water. You could live on concrete and turn on a faucet but if you live out there, that is where you become culturally attached. You adapt to the situation, the

climate, the series of water and the culture is formed in that way. You take a native in the Americas and you take an Arab tribal guy you talk the same language because you are both talking land, talking religion, culture and you can communicate and I imagine that you could pick someone out of Africa and talk the same language...where ever. If you have a land base and if that is where you are, that is what you are going to be, you are going to be culturally attached to the land in a holistic way, you are going to have an earthy approach and a connection to the earth and the water. You are going to have an earthy understanding of it all. We sure have to protect it otherwise; we aren't going to be talking in another 30 or 40 years. Think of my grand kids. I think that is another key here. You experience your kids, then your grandkids and them you start thinking about what it is going to be like for them and then you really begin to respect and understand.

DATE: Friday, June 26,1998

SUBJECT: Patrick Goggles (Arapaho)

ADDRESS: [redacted]

PHONE NUMBER: [redacted]

QUESTION:

- What is/was the use and need for water in the environment to the Shoshone and Arapaho people, both in everyday life and in cultural practices?
- Were/are the biologically diverse riparian corridors and stream channels culturally significant to the Tribes? How?

a. Arapaho culture is modernized and practiced in ceremony more than in daily life. The language itself is limited to elder people. Note that Patrick understands and can speak conversationally Arapaho and is able to write in Arapaho.

b. Culture is part of the political process. For instance in General council, ceremonial relationships are carried into the interactions between tribal members and there are certain people who you would not speak out against even though you do not agree with their ideas...the respect of a tribal elder, relation, etc. is carried into these interactions

c. The political process has to take in the culture to make culturally relevant/culturally-based decisions. Half the decision making process belongs to the Arapaho and half to the Shoshone.

d. General view of water has been:

1. Mainly political since the adjudication of water rights in 1978

2. Ceremonial, it is used in tribal ceremony and custom: water is used as the main element of ceremony and take on a very high degree of significance, especially when there is a fasting by men and women in preparation for ceremony (1-6 days). Water is used in ceremonial ways, which deepens the Arapaho respect for it. "When you are thirsty for it, you understand how precious it is, especially when you are thirsty of it for 3 days (or 6 days). You then acknowledge that water is precious. In ceremony, it is used and is always referred to as "the water of life" and in this way gives conceitedness back to everything around people.

e. As far as using culture as a management concept, you'll find a great deal of opposition by the decision-makers, the Governor of WY and the WY Attorney General, who have no sensitivity for the ceremonial beliefs of the Tribes. Their way of dealing with water issues is simply on fact and measurement (Acre Feet), use, future use, ground water, where as the Arapaho never did recognize the ownership of water, water is there for all living things: those that fly, those that live under the ground and in the water! It is there for all and the higher power makes decisions about ownership/use! For the state of WY to quantify the water rights the tribes is just another infringement upon our tribal sovereignty, our ability to make laws and to live by them! Culture has to be part of water management in the form of an actual model for management.

f. Common tings about water management and culture are:

1. In the spring we have melt and runoff, high water levels and lots of people using the Big Wind and Little Wind and their tributaries for irrigation. There are times in August when the Little Wind is dewatered due to irrigation by non-Indian people. Note: you would probably see another law suite by the state of WY if the Tribes tried to limit this use or tried to maintain a certain instream level of flow. The cultural side should be managed by the BIA which serves the trust responsibility of the tribes through negotiations with state decision-

makers but that doesn't happen!

2. Ever since the Big Horn I law suite was filed for quantification of Indian reserved water rights, I had the feeling that nothing good would com out of and nothing good has come out of it and the tribes have spent a lot of money defending themselves against the state, throwing everything but the kitchen sink at them. Unfortunately turn over in tribal government occurred and institutional memory was not one of the tribal governments virtues. So, through this long process, 20 years, the changes in tribal government allowed the cultural aspects of water to fall by the way side in the defense, and it never really became a factor in the trial or in latter negotiations, even until now. I think the reason it is now apparent is that we have seen other tribes around the country use cultural relevance of water to the people successfully in water rights negotiations. Here, because it is after the fact, I am not very hopeful that it will be part of what is going to happen in future negotiations. I don't know!

g. The way the people use water here:

1. Many don't use it to make a living

2. Many aren't farmers, some farm on a limited basis - hay or alfalfa for livestock

3. The cultural relevance of water to a livelihood is non-existent because people aren't farmers, and those who are into ranching and farming do it also on a limited basis because they work a full time job and ranch, because ranching alone can not sustain them. Therefore, there has to be another way to express the importance of water to Arapaho people

4. Growing up I didn't know I was poor, I just remember the closeness of grand parents, my parents and everyone living close together, 3 or 4 families living in one place-my dad, my mother, my grandfather on my dads side, my uncle on my mothers side, all lived in the house....my grand mothers, great grandmother all lived down the road and would come to our house ...I remember waking up in the morning to the smell of beans and bacon and potatoes and they would bake bread...that is what I thought breakfast was, it wasn't

until latter that I knew there was a different kind of breakfast, that was foreign to me and I had a hard time getting used to that and eating breakfast at a certain time. We lived by the river and the women would go down to the river to wash clothes and we would swim and bath, but all those daily purposes of water in the environment have been replaced by wells and water lines. However, when I was growing up the daily use of water was still significant. I still don't drink from the tap; I have a bucket of water that I drink from.... I get the water from a fresh spring.

5. The cultural relevance of everyday living has faded with the introduction of water wells and line...so it is very limited in daily life. The relevance culturally needs to be expressed more on the scale of tribal use. A large number of people are using it. It has to be domestic on one hand and culture. It can be used as a commercial use to the Arapaho culture. It should not to be leased to down stream users because people will become dependent on that income, as they did on revenues from oil and gas. However, I'd like to see small business that sell water...there is a good aquifer at Arapaho that produces good water and then cultural use in ceremony of course.

6. The environment has changed...people put waste in the rivers...how is that sacred?

7. In ceremonies, there is no overriding cultural connection for water that would cause the sun not to rise tomorrow morning; nothing is as powerful as that!

h. The riparian and stream corridors are very culturally significant. The Arapahos believe that the creator gave them cottonwood and they always use cottonwood in all the ceremonies, they also use sweet sage, juniper and the cedar tree. They use roots like sweet grass and peppermint for tea and reed like slew grass, which are burned in ceremony and use on teepees. Instream flows are needed to maintain this environment.

i. Subsistence hunting and fishing are still existent and are always based around the water...that is where the fish are and the game go.

j. Ceremonies are associated with different seasons. Spring ceremonies that lead to summer ceremonies and

they wait for signs of the start of a season before certain ceremonies take place, for example ceremonies start when they hear thunder..."the thunder bird"

k. The relationship to water exists for each person. Each person in the culture has a relationship with the river, the water and it is a cultural relationship!!

l. Model:

Simplicity is an Arapaho virtue, so the model should be simple and practical

Need to incorporate culture foe making and supporting culturally based decisions

On the practical side, although the Shoshone and Arapaho people are not commercial farmers or ranchers, they will always farm and ranch as part of their lifestyles (horses), so they will irrigate!

DATE: 7/11/98

SUBJECT: Merl Haas (Arapaho)

ADDRESS: [redacted]

PHONE NUMBER: [redacted]

[redacted]

QUESTION:

- What is/was the use and need for water in the environment to the Shoshone and Arapaho people, both in everyday life and in cultural practices?
- Were/are the biologically diverse riparian corridors and stream channels culturally significant to the Tribes? How?

Merl: This is not putting down our people, but what we are lacking in is skills, education. What happens is that they go to High School and then they go to college, maybe for one year. They decide that they don't want college. Therefore, there are a good percentage of high school students that don't have any skills. They don't have any education and they carry this into adulthood. They are trying to get jobs, but they aren't hired because they don't have the skills to compete.

Merl: What I witnessed coming back to the reservation is that I see all these different programs like in NR, forestry, water resources, and land management. All these different outside agencies are coming to the reservation and setting up these programs. They are implementing programs, but it is still an outside agency. They are utilizing our numbers and saying, "lets set up this for you, lets find out how much water is up in those mountains, how many dams can be built". Whatever reason it is. Yet the whole thing goes back to how are they going to benefit from it

and what kind of money can they make off of the reservation. Therefore, our people, because they are lacking in skill, because they are lacking in education, they are the ones that don't realize that these people that have these high paying jobs in all of these different areas, they are not Indian, they are non-Indian and they are the ones setting up these programs. In addition, we receive benefits, but it is indirectly; we receive services, but it is indirectly.

ME: Or even the information. I have been in Don Aragon's office and he had me look at all the documents from studies that have been done, but the tribes didn't perform the studies and are therefore not benefiting from this information. We have all this information but no results.

Merl: Yes. Probably 20 some years ago when I was at university, these mountains were black to Universities but now you know, with all the satellites and everything, they, I mean...I was surprised when I was asked to attend a meeting and sort of act as a liaison to the elders. It was a meeting of those that were working with the water, the um, what do they call him, the engineer, Gary Collins (Tribal Water Engineer), Tribal Water Engineer, whatever, and also there were these big business men out of Denver who wanted to build a dam in the mountains. They had all these maps and about 111-113 different sites in the mountains where there were possible dam sites. In addition, you know what, I was just surprised. I said, "25 years ago this was a black hole and these people had all these maps identifying our landscape." I was reading them and reading the maps. The elders were just looking at them. It reminded me of when the tribal people in South America, when outsiders started identifying where they wanted to log the rain forest. It was the same situation. And a lot of the Shoshone elders were saying," we don't want people up here. These mountains are so old, and there are many tribal people that went through here. They are buried in these mountains. They used to have ceremonies in there."
It was interesting because I listened to all of that, and what they were talking about was big bucks. You know, they were saying we can improve the economy of this reservation. We can pay! Then they were talking about cutting trees, and they were talking about this machinery coming into the mountains. I thought, we have bears, mountain

lion, and mountain sheep. We have all that wildlife that live up there, and there are certain times of the year that the tribal people go hunting up there, like right now, before ceremonies (Sun Dance) they go hunting up there, they have a license and then they have their regular hunting season. You know there are, because some families that don't work, hunting season is actually a time of, where they still hunt for subsistence and it is a lot different then how non Indians look at hunting for trophies or something like that.

Therefore, just thinking about what they were talking about, they were all businessmen in their suites. I heard some of the comments from some of the people there. One of them was for future use. Interestingly enough, he is a tribal person. He said, "future use". They were looking at back packing and recreational types of things in the mountains. What came into my mind was what they did to the Black Hills. There are many people who make money in the Black Hills, but tribal people don't get any of that money. That just kind of frightened me.

So there were many things that I just didn't feel comfortable with, and they never really asked the tribal elders. There were about 10 elders there, maybe about 5 from Shoshone's and I was there with 2 of the Arapaho's. I guess there were about 5 all together maybe. They were vocal, but it was kind of amongst themselves. They were saying, "no we really don't want this." They weren't really asked what their attitude was and it was just like, we are going to give you this money and we want you to do this.

In addition, at that time, during that meeting, I had an emergency phone call, so I took it. It was crazy! Some crazy thing was happening at the Arapaho cultural museum and I was working. I had an office there are that time, so I had to go ahead and excuse myself. I can't remember what his position was then, I think he was superintendent of the BIA, and he said, "I want to know what you think of this meeting." He probably shouldn't have asked me, but then I am glad that he did. I said, "well for one thing, I think for a big business to come in here and go to the General Council to say that they have this money to pay you to build these dams, is wrong. I don't think that you'll go because you speak a different language. I am not talking about the English, Shoshone, or Arapaho languages. What I have been listening to, you are talking in a language that tribal people aren't familiar with; you know Aquifers and so many acre-feet. Tribal people don't understand that language. Yet, they have lived on this reservation, and are

very familiar with the environment, but it is a different language. If you introduce this, it is not going to be meaningful. It is going to be almost threatening because they are not going to know what you are talking about. So then, there are certain ways, you don't just hand it to them.

The other thing was that, tribal people, they held up that banana before when they talked about that Boysen Reservoir, and they told the tribal people that they were going to get a lot of money and that all this stuff was going to happen when they built that dam. Right now the water comes from our mountains onto the reservation and into Riverton and Riverton has all that water and then it pours into Boysen. I said right now the tribal people they have no kind of control and they get no kind of revenue from that and not only that the water that goes down stream, all those water users down stream, they pay but they don't pay the tribes. I don't know if it is the Bureau of Reclamation that is getting the money while the tribal people just totally lose out. I think that they need to be careful because if they start building these dams, who is going to control the head gates. Further in time, they are going to say, "we control the water because we built the dams. The water that comes to the head gates belongs to us." I mean, there are many different issues that need further investigation. They started getting uncomfortable. I thought, this is so strange, why aren't they addressing the issues. This is just about money.

Gary Collins was there. Do you know Gary Collins and Darwin Greeble? They were all just sitting there, and I thought, hey guys you should be talking about this. You should be concerned. It can't be just money. Then I heard somebody mention about future use. I said, "future use to tribal people is not recreation or back packing or canoeing. Future use is clean water, clean land, and clean air for future generations and our wildlife." All I know is that they were going back to the drawing board, and I don't know.

ME: They never came back

Merl: I don't know, I don't think so, but anyway that was kind of an experience there. The other thing that I found out is that the water through here (Ethete), we don't drink, we get bottled water. The EPA came out and did a study

and they found out that the water that comes through these mountains, that goes through sage creek, you know up there, and there are some oil fields up there, I don't know if you have ever been there? Water comes and oil was seeping into the water. Therefore, it comes down to the lagoons here, to the hot springs, and those minerals are seeping into the water too. Then it comes further down stream, and there are old cars packed into the banks of the river, so the chrome and rust is seeping into the water. So, that it was supposed to help the erosion. So, by the time it gets to Ethete it is bad, it is bad water. And I don't know but I think that is why our people are sick because when I brought it up to someone that was supposedly supposed to know about this, he said BIA has know about it for the past probably 50 years and I said well how come nothing has ever been done? It cost money, so what are they going to do about it.

ME: You know that people will dispute the idea that inner city communities are targeted as areas where industrial areas are built, but people didn't ask question and now they are starting too and they is really no denying that minority communities in a lot of instances have been abused with environmental problems.

Merl: With our oil and gas, but also when they first established the reservation. They had allotments and the land that was left over they opened it up for settlement so now from Riverton there are a lot of non Indian people on tribal land and Riverton is within the boarder of the reservation but people don't understand or except that, they don't know that. It is strange because they don't recognize the fact that they are within a unique cultural area. Like I said they just see the 20 people that walk the streets or are in the park and they have a real negative image of tribal people and they don't understand that we have people on the reservation who are administrators, who are Indian teachers, who are Indian artists and it is interesting. Mark Soldier Wolf was probably a good person to talk to because he lives along the river, he has ridden this river, and he could tell you many things that I could tell you. I made some friends in France, there family would come to Laramie, and they would always bring them up here.

ME: From what everyone had told us, a water resource center should be based from an elders standpoint rather than making it political

Merl: Exactly, I think that the times that we have lost on water issues in t in court because the cultural perspective of tribal people was ignored. It wasn't brought forth and now after words they are trying to bring it in there, but there is something lacking. It should have been there in the beginning. However, it is interesting because some tribal people, and these are tribal leaders, still have that mentality. Maybe they grew up in a boarding school, or because of the kind of education they received. It is because we don't yet possess the infrastructure with our tribal government and the knowledge, to be able to really have control over these resources. We are lacking in training and knowledge. Therefore, they believe that it has to be white people and that we aren't capable. I don't believe that. I don't buy that. Therefore, it becomes a conflict. You introduce, you try as a tribal entity to have a tribal council. You need to do this or that but they say wait, wait, and wait. I think that they are admitting to themselves that they don't know what to do. That is why it is important that we have people like Wes, WRA, and me. I am no expert on water, but I just know the importance of it to tribal people, and to the communities.

ME: What I am doing for my thesis, is talking to tribal people about the importance of water, water in the landscape, the ecosystem around the river because in many places the only thing used to manage water is ecology and that is the mistake being made when it has significance to people. I will develop a model.

Merl: There is another person who is doing this from Chicago.

ME: One of the tools used is GIS and I was talking to Teresa about way things have done in other places to use GIS to record tribal ideas and knowledge and I realize that I don't want to say this is what you should do, because it may not be acceptable to the tribes.

Merl: And I think that is often the reason why we have so much failure with programs that come in and are implemented. About 20 years ago, they had 9 suicides on the reservation. The age group was kids coming out of High School, with no future. After that, 60 minutes, ABS, CBS were on the reservation trying to photograph our people at the cemeteries. Death is a real private thing; there were men that had guns chasing them off. We didn't want that because it is a private thing; mourning is a private thing here. However, I was thinking about it. After that time, a lot of money poured into the reservation and what finally stopped it was the elders, they had an age-old ceremony and that finally stopped it. Now, after that all these years, they have had all this money pouring in for our youth, yet we have the same problems. In some ways, it is worse. It is because psychologists have this book of information and we are statistics. We are numbers and a lot of these outside agencies see us as money. These institutions and agencies, they use our numbers for their money. That is how they get the administrative costs. That is what I mean, we receive services indirectly. Because the University does that, they call and ask "I need to know how many drop outs you have had and how many people have graduated" and I say why and they say, well, we are going for a grant and I don't think our reservation is going to see that money.

d. One thing is that our elders are very respectful and they try to please you in any way and they will treat you very sweetly but they won't tell you anything. Myself, I am not mean but I don't like to be phony, I try to be as honest as I can. I think even if there is someone who won't tell you about the negative stuff it is important to hear it.

e. A chief from South American came up because he wanted to see how the
Tribal people had their tribal government and education because they are under the control of the government there. The biggest difference between his people and ours is that they have been able to maintain their cultural identity through their language, they live like they lived 50 years ago whereas we don't, we have been assimilated and we have lost a lot, we have sacrificed a lot for that.

f. My mother said that they couldn't speak English when she started missionary school so she talked her cousins in Arapaho and they drug her to the washbasin and washed her mouth out with lye. And right now what I think needs to be happening is that our old people need to be healing, the boarding schools, that is where our abuse started, sexual abuse, child abuse, violence, that is where it all started. The priest used to beat the kids; they have stories about some of the brothers that they used to sexually abuse the children. That is where that cycle started and now they think that we do that, that that is part of our culture and yet that is where they learned that. If you look at traditional society as it existed before that, the age old history, it is not there, there is nothing like that, these problems that we have now. We need to go back. We need to go back to the values of generosity, sharing, and bravery.

Sometimes I look at our youth and I feel very sorry for them because they can't speak the language, they can't do this, and they can't do that. I always look at their experience, whether they are negative or positive, they are like adventures. See, I am a storyteller in the tribe. I tell these stories about our child heroes. They come across some things that are evil and bad. Well not necessarily, the English language distorts the story, it strays away form the naivety, the naivety of the story itself, by utilizing evil. It is an injustice to use those words. I am not comparing it to a good fairy tale, bad versus good. A good example would be, one time a student wrote a poem.

Rose Bud: Black is the color of the life given rain before it falls and hits the earth.

Then you look at American writer and what black resembles. It resembles death, doom, and dirty. White resembles peace, purity, and that type of stuff. For Arapahos, black is happiness and it is also victory. So, when I hear these kids and see some resort to anger and violence, and I feel sorry for them. In addition, I have to remind people, within our tribal realm and tribal societies, that those things aren't there. It is the influence of the outside world, TV, our media, whatever. In addition, we shouldn't be blaming ourselves; we need to go back to teach these values of respect but it is hard because there is so much variety.

ME: One of my questions is recording tribal ideas in a way that protects those ideas. That is something that can be done but is that something the Shoshone and Arapaho people want to do because that would make that information available for resources management, but not necessarily by the individuals who hold that information, but how do the tribes feel about that, how do you feel about recording this information is protected. What is the implication of doing this in an unwritten language?

Merl: I need to get some things done.

DATE: 6/27/98

SUBJECT: Burtin Hutchinson (Arapaho)

ADDRESS: [redacted]

PHONE NUMBER: [redacted]

QUESTION:

- What is/was the use and need for water in the environment to the Shoshone and Arapaho people, both in everyday life and in cultural practices?
- Was/is the biologically diverse riparian corridor and stream channel culturally significant to the tribes? How?

MAIN IDEAS DISCUSSED (Since much of the information was repeated)

- ❑ Arapaho were creationists prior to the introduction of Christianity, they believe in higher spirits
- ❑ Water is greatly used in ceremony and is viewed as sacred
- ❑ The Arapaho are not an agricultural people, but farmed subsistence livings, mainly corn which is also used in ceremony
- ❑ Water for people, the future generations, is needed
- ❑ A fear that the state of WY will attempt to go after the water rights and reduce the rights due to the fact that they are not simply using the water for irrigation
- ❑ Political system of the Arapaho was changed to be more like that of the US Government, from a Chief system

to an council system...a way to wipe out culture in politics, but the ceremonial relationships are still respected in council

DATE: 3-13-98

SUBJECT: Wes Martel (Shoshone/Arapaho)

AGE: 45

ADDRESS: [redacted]

PHONE NUMBER:

QUESTION:

- What is/was the use and need for water in the environment to the Shoshone and Arapaho people, both in everyday life and in cultural practices?
- Were/are the biologically diverse riparian corridors and stream channels culturally significant to the tribes? How?

CULTURAL ASPECT OF WATER

Water is referred to as the water of life

Much of the ceremonial use of water remains sacred and can not be divulged to individuals outside the tribe

Water is used in ceremonies and is an essential part of Shoshone/Arapaho culture

Water is essential in Sun Dance, sweat lodge and many other traditional ceremonies

HOLISTIC VIEW OF WATER IN THE LANDSCAPE

From a traditional viewpoint, water is an essential part of tribal life

Technically speaking the hydrologic cycle could represent the Tribal view of water, it effects everything and its purity it effected in turn by everything

INCORPORATION OF TRADITIONAL KNOWLEDGE IN WATER MANAGEMENT ISSUES

It is essential to incorporate traditional ecological knowledge and management ideas into the tribal water management techniques both to protect the culture and the water

Recording of this information should be done by tribal people

DATE: Friday, 26 June 1998

SUBJECT: Mark Soldier-Wolf (Arapaho)

AGE: 65

ADDRESS: [redacted]

PHONE NUMBER: [redacted]

QUESTION:

- What is/was the use and need for water in the environment to the Shoshone and Arapaho people, both in everyday life and in cultural practices?
- Were/are the biologically diverse riparian corridors and stream channels culturally significant to the Tribes? How?

a. Ceremonial offerings were made to the river: throughout the year and the seasons, people would watch for and collect items to be offered to the river spirits. Mark had a perfectly round stone that he found and would offer this year.

They would go to an area by the river and burn things that smell good...sage, buffalo hide, grass, rock gum. And they would talk and pray to the river spirits at these gatherings

And when they were done they would throw the offerings into the river

They would pray to the water spirits (the water creatures)

As the sun was coming up, they would have a final prayer, the white man calls them incantations, and the water would whirl like a bunch of little sun devils, like tops, some would come together and you would then get a water spout, showing the people that the water spirits were there.

b. We would camp by the river for 4 days and would tell stories. There were prophets (learned people) for different things. There were weather prophets and water prophets.

c. We catch rainwater in indented sandstone and would save it for use in laryngitis, sores, sickness and ceremony. For medical use, the patient would drink the rain water in conjunction with the medicine mans prayers

d. Water is polluted and the water spirits aren't available when you want to pray to them because the water is not pure. The prophets said that the water would get thick like jelly wit contamination and this was 30 years ago. All the prophets know that all things are connected and that polluting the air, we affect the water and by polluting the water, we affect all things, the clouds, the air, and the soil.

e. Water is used in ceremony like sun dance and sweet lodge

f. Things used to be protected and respected

People traveled long distances by foot and horse back with no pollution

They viewed the smoke from fire as sacred

They spaced the birth of their children by 4 years so that they could provide for and care for them

Now things are out of control, pollution, our children having children every nine months when they are babies themselves

g. Riparian Ecosystem: Plants are taking different forms today, they have changed from what they used to be and now some that were smooth have prickly stems. Ceremonial herbs are becoming more difficult to find.

Knowledge of the seasons for growth, the location and elevation (habitat) for growth is held by Indian Drs, medicine

men. They would travel great distances to gather roots for medicine. This knowledge is not simply passed down, Indian people have to get up when they are young and participate in learning this from the Indian Drs., the Medicine Men in order to know the plants, to know how to use the plants and roots, and how to prepare it for use.

A lot of skepticism for sharing the medicinal knowledge because it has been tried before and white man has said "you need to be educated to know medicine" but we need to not only show the plant. "We tried to contribute to the white people, what the medicine man knows and they won't do it. We know solutions that heal scars, your stomach, etc., from different parts of the plant. We keep insisting we can help. Just think about how tremendous these solutions would be to the people who suffer from disease but we have failed because they tell us that you have to be educated, a learned person in school to explain this. They thing is that the time of year to get these roots and plants, what you do harvest them, how you put them to use and when it is in use, how much do you administer? Then how do you watch your patient? They prefer drugs, but the medicines heal you! We have learned the hard way to let the white man go his own way and we will do out own.

And there are stories to these medicines, beautiful stories, like how the buffalo pitied the man and said, "I pity you man because you are just a creature like I am so I will take you to this place where you can dig up this root for medicine. So the buffalo did that and had these Indians go with him and they found the place and the buffalo dug the root out and the buffalo sat down beside them and was cooking that medicine and got the bark off and the next bark and got the nut out. Then he showed them how to cook it weak, medium or strong and you use it for 4 days and the person will be healed...that is buffalo root."

All these medicines have their stories, how they are made, where they are found, certain time of year for example there are plants that don't grow every year, they grow every two, four or even 5 years...and they need to know that. The MEDICINE WHEEL clocks all that but that is getting lost too. There is a medicine wheel in our Owl Creek

mountains and medicine men would go there, journey there and would fast there for a number of days depending what they wanted to know and the wheel would tell them where to go for the plant. Medicine men came together and exchange stories during Sun dance

h. Arapaho words

Arapaho words:	Big Wind River	Bas Niche
	Little Wind River	Ajus Niche
	Yellowstone (Elk) River	Bucko Niche
	Laramie	Bene Lou

All the mountains and places have Arapaho names

i TAPE 2A: Talks a lot about the Arapaho in the Front Range - A lot of history in CO. A lot of land that still belongs to the Arapaho. Eight miles from Ft. Collins, on the East side of Ft. Collins (where there is a rest area), that is where all the chiefs of the Arapaho people met for a big council. It was a large village; many different circles were at that rest area

DATE: 12/3/98

SUBJECT: Harrison Shoyo (Shoshone/Bancock) and Ana Marie Shoyo

AGE: 72 (Harrison) 74 (Ana Marie)

ADDRESS:

PHONE NUMBER:

QUESTION:

- What is/was the use and need for water in the environment to the Shoshone and Arapaho people, both in everyday life and in cultural practices?
- Were/are the biologically diverse riparian corridors and stream channels culturally significant to the Tribes? How?

They did not want to be recorded and were reluctant to discuss the tradition surrounding water. Anna Marie expressed the reason for her reluctance, she was brought up in a boarding school and was therefore away from traditional like for most of her up bringing therefore she felt she couldn't really truly represent cultural ideas and didn't want to give out improper information. They were quite stand offish at first and spoke to one and other in Shoshone and eventually started talking to me as well.

Harrison:

Harrison discussed how he had worked on the building of the water treatment plant in the early 60s. It was a difficult thing because they believed that rather than purifying the water that it killed the water, removed the life, the spirits of the water, and would therefore make people sick. In addition, he felt that many tribal people did begin to get sick at that time because the water was treated with chemical. Eventually people became used to drinking the

dead water.

Manipulation and respect for nature:

He also talked about the idea that you can't change what happens in nature. He mentioned that the events, the rain, the snow, and the wind, and the way that the land responds to them occur in the way that the creator makes them happen. The tribes are related to the land, use the land, are connected to the land, and respect the land. He said that this respect is disappearing in tribal society.

Naming:

He talked about the way the white man changed things and the way that name, Shoshone names for people, couldn't really be translated because they were "bad" according to the white naming convention, like "step on shit" and he said the Shoshone name of the chief that would translate to step on shit. He said some names couldn't be translated because they would appear to be vulgar.

Anna Marie:

Her clan was named for a water bird and historically they would hunt the bird for food and then place its head on a stick to be carried as they traveled, thus denoting the clan that was approaching.

She talked about how they work with the schools teaching traditional ideas. She spoke of children and how she didn't want to tell cultural specifics that were not absolutely certain because she had always learned that you had to always be fully truthful about tradition and all else and that if you weren't it would harm both the children and yourself. Truth and respect are the most important things in raising children and that much of this has been lost in tribal families. She feels children are not always treated well, children don't listen and it is a terrible cycle.

She discussed religion. How they follow the calling of what they feel for the elders. When they feel they have been called by the ancestors in the traditional religion, they follow the calling, for instance, they are going to Nevada.

They touched on water and the fact that the spirit of water is the most important thing. They talked about how they felt it to be ridiculous that they have to pay for the water used to irrigate and how it goes against what they learned that water isn't a commodity.

Any ideas about true tradition and cultural ideas, the fact that tradition is passed down orally and she didn't feel that it should be written down.

He mentioned that the purity of water is essential and that the water belongs in the landscape, rather than from the tap. This is because, like all other aspects of life, water has become a simple commodity that can be taken easily in the home. Everything has been made easy and therefore things are not necessarily respected as they used to be.

DATE: 8-21-98

SUBJECT: Star Weed (Shoshone)

AGE: Late 80s

ADDRESS: None

PHONE NUMBER: None

QUESTION:

- Could you express the cultural view of water and the idea of what the environment means to your people?
- Could you also explain traditionally how things have been managed in the environment according to cultural beliefs and whether those techniques and ideas are still used today?
- What do you think about incorporating cultural ideas and methods into water management practices?
- What is/was the use and need for water in the environment to the Shoshone and Arapaho people, both in everyday life and in cultural practices?
- Were/are the biologically diverse riparian corridors and stream channels culturally significant to the tribes? How?

Ceremony

Really, you know, we have many uses for water in our ceremonies. That is how we use our water in the Native American church. We use water for time that are so important to our lives. It keeps us alive; it is the water of life. We always put it ahead of everything, even our food, it is real important that we use the water that way because it was made by the creator and we remember him that way. Everything needs water to stay alive. It is in our ceremonies like in Sun Dance it is very important, we fast and don't drink water for three or sometimes it is 4 days. We see that water as something we fast for, no water and we pray. That is the way that he shows us, the creator shows us things. Certain ways of showing us, messages. Like the dove, it was the spirit of the person who baptized

Jesus. It is very important to us this water, to the fish. The old timers before they went to sun dance went fishing before they went into Sun Dance. Sweat baths, it is very important in those ceremonies; we use water in there too. That is the way we use it. It is very important that water.

What were you taught and how did you picture water in the environment

We really respected water and all the things that grow, the trees, the pine trees. We learned how to respect it. If we went to cut a tree we prayed, for the roots we would offer a gift before we took it to make medicine out of them. Use it for our health. In addition, we really respected it that way and then when we see the water being contaminated and the things like that it makes us feel bad. I know that, preparing for Sun Dance before cutting trees down to put up a lodge, we offer prayers. When we put up the lodge, we offer prayers. We don't just destroy things that are made by the creator. Everything is religious. It kind of bothers us when we see spilled oil in the water or when old cars are sitting in the banks of the river. Things like that you know. However, people know it. They themselves study those things too, they try to avoid them and keep them clean. They know the Indians to be that way. What else?

How are plant in the riparian corridor are important to the Shoshone people, for medicinal purpose, for other purposes. What is the cultural value of the riparian corridor? How was the knowledge passed?

Our knowledge is passed down by the old people who tell us about different plants that can be used for this and that. Some are meant for colds, some are used eat you know, bitter root they call them. In addition, things like that. We have all different kinds of plants that are used for certain things. For colds we use sagebrush, we make tea out of it. Some roots we get and usually keep in our mouth and swallow the juice for colds, you know. In addition, some we use for swollen hands or things like that. We know what kind of plants grow too, we have those kinds of teachings that come from the old people and come down. I think that the younger ones get so that they don't care too much about it. Their style of living is different, they have TVs, radio and when they get sick, they just go to clinic.

Whom did you learn from?

I would just see my old people use different kinds of plants and what it was for, that is where mine comes from. From the old people who passed it down. I used to like to sit and listen to them, I would just sit there until they were through and they would tell me about different things, their religion, like Sun Dance and things like that. I was a good type to sit and listen; I had someone tell me that. What else is there?

Where are the majority of these plants? Are there other things that plant are use for other than medicine?

Yes, they still go different places for them. Some of our plants are in the mountains, some along the creek too. Sage is by the river and we use that quite a bit, sweet sage. They grow all over.

Do people have knowledge of where certain plants grow?

Yes, some. I know where to get certain kinds of medicines?

Plants change themselves, sometimes you will see them in one spot and then you will see them somewhere different.

Do the Shoshone people manage plant areas where medicines are known to grow?

We just let it go by itself.

Do you think it is important to include cultural ideas in tribal water management?

Yes, sometimes, you know, we are asked questions to protect our water. Sometimes they call on me for that purpose. The rest of it members didn't know because they were younger and they wanted to know certain things. They were investigating the cost of these things and um they asked us to answer some questions about ceremonies, about how important was the fish. Fish was important but the water was drained out so low that, some of the fish had a hard time staying alive. They didn't leave no in stream flow in the rivers and drained it all out for agriculture.

They asked me how important it was for fish and what we used the fish for, in ceremonies, that is one of the things I was telling you about. The leaders would catch fish and use it before they went to ceremony; that is one of the things that I mentioned. And that is one of the things that the rest of the members didn't know as I was telling you, when the old folk sit down and talked, I sat and listened to them and that is one of those things that was told to me by one of the leaders, a Sun Dance leader. He told me, I go fishing before I go to the ceremony and then I eat fish for a certain purpose. That is what he told me and that is what I remembered when they asked me. Then they called me to go to Washington DC. So I went and they sent me money to travel on, eat on, sleep on. Sorry I caught a cold out there, I was bailing hay out there, the grass was nipping at me, and I caught a bit of a cold. Anyway, that is what I was called to Washington for. That is what you have to remember and know, you might be asked some type of question like that and it is good to remember that stuff.

i. The importance of instream flows:

The superintendent went up and asked me about those things for the reservation our water, the canals and what they are used for on the reservation. He wanted to know how important it is to keep instream flows and that was one of the things I told them and they wrote it down. It is important and no one else knew. That is the reason Wes refers me to students and things like that, you know Wes. You were with him at Indian Days. I worked with him in the council.

Instream flow is important to keep the fish alive because the fish are important to us, we live on the fish, and we use them for food. That is why it is very important to remember things that were told to you. It is also important for fish and wild game, gives them something to drink gives them something to drink and it keeps them alive. Even us, you know, water keeps us alive and so it is very important to us.

j. Do you think that cultural ideas are included in resource management?

Yes, I think so. We really keep a lot of our water for ceremony. It is very important. We use ours that way but other nationalities use it for irrigation, for their crops. We do that too. But really, our people use it that way but the other side, what kind of a background do they use the water for? They are not really like us, I just hear that they use it for ag, but the ceremonial uses of the river that not true on the other side. But ours, I know that way. I never did. Remember I said I was telling a group of farmers and ranchers this spring, they were having a conference over there and they were going to come to the reservation, they wanted to check on the cultural part of their meeting. We were having Pow Wow and they had a big dinner and they were checking everything on the reservation, and I was telling them about the cultural part of the environment. They go me to talk over there too, about our background, the treaties, things like, we stayed here day after day, month after month, years after years, we don't move like other nationalities do from city to city, we don't sell out and move to another place and buy another place. We don't do that, we stay right here year after year and we enjoy it that way. Because it is set up by treaties.

Do you feel a connection to this place?

I was in the army but I knew that I had a home here, a place to come back to when I got out of the service. It was just like it was marked, whatever I did I stayed here, worked for the people, got on the Council, got on the School Board and then we had a bishops committee that we formed. I joined everything that was available to try to make a better living for the people. I have been here ever since that time and I am still here, it is my home. I am so used to it here, that I am home. Then when I went in the service, I knew what I was fighting for, for my home, my country. When I get back, I hope it is still here, the people, ya know.

How would you suggest the elders involvement in resource management?

They get us involved here, to go out and look. Like a company came to lease the wild lands, they called us elders to go over there, or where ever they are going to drill they ask us to look and see if there is any cultural value or if there are any graves there, and things like that. If there is we tell them no, move another place. They let us go out and get

us involved like that. They ask us things; they don't pass us up. We are involved. Yes.

Oral culture?

My grandchildren are interested in carrying on the things I do, they come to my doings and listen. That is good, good that way instead of loosing it. We loose many things in Shoshone.

Is everything passed down orally?

Yes, they all catch on. I learned what little I know. I learned how to put up teepees, different things about ceremonies, I tell them some good things. Because they are interesting, that is when I do that. Some don't get interested; they are too busy doing something else. However, the ones who do get interested, I show them you know, right away what to do. Different plants for everything for medicine, ya know.

Language

Language is running out. There are people that really know the language; most of them are not learning it now because we have a lot of intermarriages, different tribes and nationality. That is where the language is running out because you can't speak the language when you have children because they themselves are not learning it and it is just running out. I speak Shoshone.

Shoshone words and the naming of the landscape

Things have Shoshone names, the rivers, and the mountain. The names are kind of fading out and the white man names are being used. Well, I use the Shoshone names quite a bit but the younger ones don't. They are trying to teach it in schools now but it is hard for them to learn because they don't speak it all the time. It is easy to forget because they don't have anyone to speak it to.

Naming of plants

Are based on stories, colors, all that, and the way they are used. Flowers are named after the way they look, rose bushes (he says the word for red flower). He showed me a picture of his grandma carrying his dad in a back cradle and said that is the way they used to carry the babies. My Grandma Marry Enis. My fathers name was Bat Enis. The government took his name and put a Weed on his name, so his name was Bat Enis Weed. That is why my name is Weed. I am an Enis but I am a Weed too. He shows me a picture of his grandfather, her man, her husband. These are from way back.

Well that is the only way I know that things were named. The rivers were named according to the tree that grew on the banks if there were big groups of trees or if there a big cliff there and the water was running near it, they would name it after the big cliff and name mountain too. By looking at things, they named them like that. If there were many bushes, willows, they would name the creek after them. Or if there was a mountain, over there and the enemy used to, you know there were a lot of enemy tribes and when they would see each other they would fight, and if they used that as a look out for the enemy tribe, then they would name that mountain that way. This is the way they used to identify the hills and the rivers. That is where they used to fast and to offer prayers then the Indians would put a little gifts around there. That is what that medicine wheel is all about too, they go there and fast and pray. So, anything else? That is about all I know. The rivers and the lakes too. If it were shaped like a moccasin, it would be called Moccasin Lake. Like the lake in mosquito park which was named because of all the mosquitoes. But, they used to give different things names. Bull Lake got its name from the water buffalo. Our tribe used to hear water buffalo make noise at night there and so they named it after Water Buffalo (he says the name which mean that they used to make noise there) and the whites just called it Bull Lake and left out the Water Buffalo out of it. The Shoshone name for the Big Wind River was Big River (he says the Shoshone name). The whites named the Washkie needle, it was called Washkie needle in Shoshone because it was pointy. Wasakie is a gourd, which he used to use when he wanted to steel horses from some enemies. He would shake that gourd and scare the horses, the horse would take off, and he would hear them and take them.

Court and traditional information

People need to know those things too. When you get into court, like water, they ask you everything and if you don't know those things, you might loose out. Just like that. I went to Washington for court and then I went the other direction. We did some good there; I know we did. We talked about the water. In the instream flow cases, we told them about the Indian side of it. The man above said it is for everything, for the fish and they are just important as the agriculture. You see many things like the state saying we can only use it for ag. But, the man above knows. What are they going to do if he takes the water away? What are they going to do then?

Agriculture

Our Indian people, when they first started out, they went into ag. The government helped them with machinery, they would use that machinery, and they plowed up the place here. That is the way that they first started out and they were good ag people, putting grains, crops and gardens. They had good gardens. My mother and father used to have good gardens: squash, carrots, turnips, potatoes, corn, everything. Our cellar was plumb full in the fall. My mom made jelly, she would go out to the creek and she would get chokecherries and bull berries and would make jam. Her cellar had the shelves just plum full of jelly. In the winter, we would go down, get what we wanted, take it up, and eat it. We had plenty to eat from the farm. The government helped, boss farmer they called him. They had boss farmer to help the Indian. As time went by things changed, the gov done away with boss farmer and no more machines and people seemed to stop putting in gardens. It kind of seemed like they all quit doing it. Because when I was younger in the fall I could help with my team and the hayrack and we had a mill that all the Indians would take wheat to and make their flour out of it. All those things are gone, and people don't want to get out and do anything now a days, they just sit in the house and watch TV. In my young days we had to burn wood and kerosene lights, we didn't have baths in our homes but we went to the hot springs every weekend on horseback. We didn't have modern homes like now. Things are different now. You don't see very many Indian farmers, some have cows and

horses but they don't do things like they used too. Things are different. It seems like all the gov positions where they helped the Indians, they weeded them out and you don't see people going out, helping the farmers that are done away with. In addition, the people quit farming. In my young days, I would see the thrashers come in. They would go to one home and everyone would help the ones who were getting their grain thrashed. They would provide a great big feast for the helpers that came and helped, and we would go and help. Then it moved to the next place and moved on up the creek helping those that needed help. That is all gone now; people don't even help each other. It has changed. However, I was raised that way and I have cattle and horses on my little ranch over there. I don't get help any more from the way I used to get help. They don't even go out in the fields, they used to live day by day over there but that has all changed now. Now people have machinery, no more wagons, teams or saddle horses.

Some of the farmers had their own ditches; most of them had ditches. We have a few canals here now run by the BIA and they charge us for water. We are not supposed to pay for water but they charge us.

DATE: 7-11-98

SUBJECT: Teresa White (Arapaho)

AGE: 57

ADDRESS: [redacted]

PHONE NUMBER: [redacted]

QUESTION:

- What is/was the use and need for water in the environment to the Shoshone and Arapaho people, both in everyday life and in cultural practices?
- Were/are the biologically diverse riparian corridors and stream channels culturally significant to the Tribes? How?

a. In Stream Flows:

1. That is what the state of WY is trying to limit, not only WY but also all Euro-American States because it an arid region and the In Stream Flow is their moneymaker.

2. Have you ever visited with the Crows in MN? They rely on instream flow for their water because there are no mountains there. They have the Big Horn adjudication on the Big Horn River. Our water from way up there in the Wind Rivers goes all the way down, you see the Crows don't have water, what they get is instream flow, there aren't any mountains and lakes. It is not a mountainous area; the Rockies are North East. Anyway, Instream flow is critical to the tribes that don't have a watershed, like the Crow Tribe. We have a natural watershed, and we have 500,000 acre-feet. Our watershed is very important and the State, it just blows their mind that we are in the

watershed. We are in the biggest watershed in the state of WY. That is the reason why there are a lot of problems and a lot of animosity. In addition, it just burns them that we have the watershed.

b. Water Resource Center and the recording of traditional information

I think what you have to do is, we can give you an idea of how water is perceived but like for the specifics, what is in the water; there is medicine in the water that we use. All these kind of things, even the council has to go before the spiritual elders, the ceremonial elders to get permission to write down that information. Because that is not, it is business but it is cultural. What you are going to have to do before you even start? This is what they should have told you over there. Now, on the Shoshone side, I don't know. You have to realize that you are dealing with two tribes. On the Arapaho side, you have to get the authorization from the spiritual elders, the tribal elders, to talk about it. You explain to these old people exactly what you need, the specifics: like the medicinal plants, how medicine flows along the water. See we ran into that when we got into Boulder when we were trying to get the BLM land. They wanted us to identify plant life, to find our how it was spiritually and culturally significant to us because that would validate our claim to BLM land. I traveled with one of the elders, Hyram Arneho. He passed away in February. Before we were even to do anything like that, we were going to come back and set up a meeting with those elders who were in that position to give authorization to talk about this waters, plants and medicines. We were going to do that to see whether they said yes or no, whether we could even do that. We didn't get that far because the project was halted for one reason or another. They wanted us to identify plants and herbs in Estes Park too. They had some anthropologists and cultural anthropologists that were hired by the NPS and how we are going to do that I don't know.

The general purpose of water

Again, I can tell you what water means: the water of life. Water is in our ceremonies, we even deprive ourselves of water by fasting, you know and that in and of itself is just a known thing that Indians do, more so for the Arapaho

and maybe the Shoshone, I can't speak for them. Water, we use it in the ceremonies. In our peyote meetings, we use water a lot; we even have a water woman position.

ME: A water woman? What is that position?

A lady who brings in the water as part of the ceremony, that is about all I can tell you. However, there are books written on it and I can give you one source, his name is Omar Staurt. He is a person that you might want to look up in the library. He has a lot on the Peyote religion and the Peyote religion is already written down.

ME: So that is Arapaho religion.

It is all Indians' use Peyote. Therefore, that is already written down but coming from an Arapaho point of view, we didn't write ours down but the rest of the tribes did but we practice pretty much the same. As far as the deprivation of the water through fasting and the ways that we use the water. We do have our medicines around the water but I am not authorized to tell you that and it would be foolish if I did. It would have to come from somebody who had the authority to do it. However, we do know that water does play a very cultural and a significant part to the Indians. In and of itself, it is just the idea of mother earth, the water nurtures her, helps her to grow her grass, give growth to her trees, her flowers, you know things like this. The water is important; it is essential, even to our bodies, which are mostly comprised of water. So you know that water is important and it has a spiritual quality to it, it has a spirit that belongs to the water. God even made a water bird, I don't how he is termed in the white man way but we have a water bird that is the one is the head of our water and takes care of the water and in the Peyote religion we use that too. We use water to bless ourselves all the time but so do many other cultures and civilizations throughout the ages, they used water. The Catholics use holy water, when we baptize we babies with water, we cleanse with water. Anyway, almost in any peoples you can see where water plays a very historic, cultural part to the way that they get along, the way that they describe themselves, water is at the essence of who they are and through that, that is how we know it is the creator. Probably, like I said again, in order to save time and give your project credibility, I would now suggest that you go back and tell the council or the people who are in authority, that they first need to get

authorization from the ceremonial elders to discuss water. This way people will be freer with you to talk about it. I don't know how the Shoshone feel, I can't speak for the Shoshone, and I am Arapaho myself.

If you go back to the council and that is what the council should be doing too, is they should be meeting with their ceremonial people because they might be the leaders as far as the business part is concerned but there are other leaders, you have to go to talk to them.

ME: We met with the council and then met with Pat Goggles, Burtin Hutchinson, Wes Martel and Mark Soldier Wolf. At this point I don't even want to address the significance of specific plants, but defining a model which defines a way to approach these ideas: for instance saying there are some good ways to record culturally specific information. I am trying to find out what is correct for you as a people, and perhaps going that in-depth is not what the people want or feel is necessary.

I don't think that it is a question of want; I think that it is a question of what we have to do. In addition, I think this goes back to the leadership; it is there job to lay a foundation so that the protection of our water is the main effort for the Arapaho people. In the water negotiations these tribal elders need to be sitting in these commissions, they left them out. The councils really know that they are supposed to do that. To me, it seems like I would know because you cut through a lot of it.

Water resource center should it be community based, should be based on elders
The elders are left out of all aspects of our tribal life. People are left out, the people in general are left out and that is why our business doesn't get done. You can't leave the people out; the people are the tribe.
You see many times, tribal politics, tribal government, state government, local government, foreign government; they do not consult the people. We are just as guilty as anybody else, tribal people. The question is, do we truly

have true representation of what the people believe. True leadership has an idea of what the people truly need and truly want.

Back again to the water issue. Maybe there will be a point in time in our lives where we say that we have to write down our culture, they have already written down the language. The language is the culture. You know and I know when you go through school and the educational process, you are aware that language is what defines a culture, your language is the culture and the culture is the language and your religion is at the core essence of your belief system, and that is what identifies culture. Therefore, if you write one down, you might as well write down the rest because you have already written it. Many people did not agree with writing down the Arapaho language, but they did it anyway with out the consensus of the people and there we are we have the Sultzman alphabet. Whatever they want to do, they did it already. To me it seems what they are doing is holding things back by not getting out there and doing it. I think the reason why is that each culture has taboos, there are taboos that prevent us from options, and I think that we have broken some taboos recently and I think that people get nervous, we are even with the title programs, title 4, Indian studies in the school systems, we don't know if we have gone too far. Then the people have changed, like it or not, they have become modern. Culture has changed and is not the way it used to be, as it should be because change is natural and as you change, your actions are different, and your thoughts are different. I guess what the Arapaho need to do is evaluate what of the culture has been exposed, this is where we are and how far do we want to go, have we gone too far already. Actually, we never sat down and evaluated what we did through Federal funding. Before you know it we were fighting the war on poverty and when we were fighting the war and sometimes you have sell some things when you are fighting a war, as Indian go we had to sell some things. One of the things we did sell or barter was our culture and our language and now we come to find out. I am not putting a value judgment on what has happened, what I am saying is that this is what happened and now we need to take stock of how far we went. Some say we lost our language; we are loosing our culture we need to write down what little we have left. Well, why did we loose the language, why are we loosing our culture, was is inevitable? Is it because we

are emerging into one? Do we have to re-identify ourselves, is that why we need the Sultzman alphabet in the Arapaho language or why we are writing down the Arapaho language? I don't know. Leave that to the experts to decide. I just watch to see what they are doing. I don't speak Arapaho but I understand. When we went to school at St. Stevens, you didn't speak Arapaho at school. They didn't beat us with belts like they used to, my Dad and Mom were the ones who were beaten for speaking their language. What they did in my age group was that they ex-communicated us from going to Sun Dance, that was a common practice. If you wanted to be a good catholic, I guess that we were all brain washed, you didn't go to sun dance or you would have mortal sin on your soul or to always be in favor with the church. We went anyway and went to confession later. I would say Father please forgive me, I went to go pray. Isn't that a contradiction?

When we try to harness natural resources, Mother Nature, that is what changes civilization. That is what happened to the European Anglo people, they harnessed nature's powers. What the white man did, he did some good things. You never make a value judgment, only the creator does.

e. Developing GIS and using GIS to document cultural information

That is hard for us to do that because we still define ourselves as an oral culture. A person told me that we lost so much now (of our culture) that we can never go back, we must go forward. He said it was lost to father time, maybe because the people now a days don't deserve it. Maybe the people don't deserve the powers that we had, maybe what happens is maybe they need to redefine themselves according to what little they left. However, many of these old ways, they already went home because people don't know how to take care of them so they went home to live with the ancestors. People should quit fooling themselves thinking that they are one way when they are not. The mind of the Indian used to be a real sharp mind. It could preserve culture in its mind, like a library up stair. Now the people have weak minds, they don't know how to preserve so maybe these things need to go home. Because the Arapaho we don't write down. True Arapaho, but there are other kinds coming up maybe it is OK for

them? I don't know. I know that I don't want to discourage people or be a pessimist but I understand what he is saying. Our minds have been polluted. We do not have good minds like our ancestors used to. I try to be optimistic and try to look for what the value of our mind is today.

f. Approach to involving community in government

Get the people to ask. Tell the leaders to ask what the people really want.... define it. When you talk to the leaders, tell them you need to ask your people. Tribal council can be very egocentric; they need communication skills. When you are talking they look at their watches and sign papers, they don't listen to the people. They are rude. The tribal council needs the peoples OK. They are powerless without the people and they feel they have power.

g. References:

Crawford White [redacted]

Molly O'Neil [redacted]

Gary Collins:

Daryl Brown: [redacted]

h. Suggestions for action

Go back to the council and tell them to have the tribal elders sit down and endorse and actually plan to save our water. I would do it now. Talk to individual members of the Arapaho and Shoshone business councils. They are too busy taking trip and going to conferences to touch base at home and to sit down with the people. They need to get a meeting together of the tribal elders to endorse, write down the things we need to do to preserve our water.

APPENDIX B

TABLES OF CULTURALLY SPECIFIC INFORMATION

Appendix B, Table 1: Preliminary Catalogue of Eastern Shoshone and Northern Arapaho Culturally Specific Information Associated with Water and the River Corridor. This table illustrates CSI that was extracted from ethnographic interviews with Shoshone and Arapaho Tribal Members

Name	Tribe	Age	Cultural Association with Water and the River Corridor	Shosone/Arapaho Ecological Knowledge of the River Corridor	Tribal Landuse and Management Practices in the River Corridor
Patrick Goggles	A	40	Water is used in tribal ceremonies and customs. It is the main element of ceremony, which takes on a very high degree of significance. This degree of significance deepens the Arapaho peoples respect for it.	Natural flows are needed to maintain the river corridor environment.	The Arapaho never did recognize the ownership of water. We believe that water is there for all living things, those that fly, those that live under the ground, and those that live in the water! It is there for all and the higher power makes the decisions about its ownership and use!
			Fasting: When you are thirsty for it, you understand how precious it is, especially when you are thirsty of it for 3 days (or 6 days). You then acknowledge that water is precious.		Culture has to be part of water management, serving as an actual model for management.
			In ceremony, water is used and it is always referred to as "the water of life". This exemplifies the connection we feel between aspects		Many don't use water to make their living; they aren't farmers. Some people still farm on a limited basis, growing hay or

A = Arapaho S = Shoshone

Name	Tribe	Age	Cultural Association with Water and the River Corridor	Shosone/Arapaho Ecological Knowledge of the River Corridor	Tribal Landuse and Management Practices in the River Corridor
			of nature, life, and water.		alfalfa for livestock.
			I still don't drink from the tap. I have a bucket of water from which I drink. I get the water from a fresh spring, because there is no spirit, no life in tap water.		When I was growing up the daily use of water was still significant. We lived on the river.
			The Arapahos believe that the creator gave them cottonwood and they always use cottonwood in all the ceremonies.		The cultural relevance of water needs to be expressed more on the scale of tribal use. Everyone uses water everyday , use is domestic on one hand and cultural on another.
			Sweet sage, juniper and the cedar trees are collected from the river corridor and used in ceremony.		Subsistence hunting and fishing are still existent and always occur around the river corridor and lakes.
			We use roots like sweet grass and peppermint for tea. We also use reeds, like slew grass, which are burned in ceremony and used in tepees.		The cultural relevance of everyday living has faded with the introduction of water wells and water lines, so it is very limited in daily life.
			Culture is part of the political		

Name	Tribe	Age	Cultural Association with Water and the River Corridor	Shosone/Arapaho Ecological Knowledge of the River Corridor	Tribal Landuse and Management Practices in the River Corridor
			process. For instance, in General council, ceremonial relationships are carried into the interactions between tribal members. There are certain people who you would not speak out against in council, although you do not agree with their ideas. The respect of a tribal elders, relations, etc. is carried into these interactions.		
Mark Soldier-Wolf	70	A	Ceremonial offerings were made to the river. Throughout the year and the seasons, people would watch for and collect items to be offered to the river spirits. They would go to an area by the river and burn things that smell good: sage, buffalo hide, grass, rock gum. They would talk and pray to the river spirits at these gatherings, and when they were done, they would throw the offerings into the river.	Ceremonial herbs are becoming more difficult to find along the river.	Things, the environment and water, used to be protected and respected.
			We would camp by the river for 4 days and would tell stories. There were prophets, learned people, for	All the prophets know that all things are connected. They have shown us that by polluting the air	

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			different things. There were weather prophets and water prophets there.	we affect the water, and by polluting the water we affect all things-the clouds, the air, and the soil.	
			We catch rainwater in indented sandstone. We save it for use on laryngitis, sores, sickness, and in ceremony. When it is used for medical use, the patient drinks the rain water while the medicine man prays.	Knowledge of the seasons for growth, and the location and elevation of growth, is held by Indian Drs., medicine men. They would travel great distances to gather roots for medicine, and they still do this. This knowledge is not simply passed down. Indian people have to get up when they are young and participate in learning this from the Indian Drs. and the Medicine Men. This is necessary if they want to know the plants, how to use those plants and roots, and how to prepare them for use. There are stories associated with these medicines, beautiful stories. For instance, there is a story about how the buffalo pitied the man and said, "I pity you man because you are just a creature like I am, so I will take you to this	

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				place where you can dig up this root for medicine." The buffalo did this and had the Indian go with him. The buffalo found the place and had the Indian dig the buffalo root out. The buffalo sat down beside the Indian and cooked that medicine. He removed the first layer of bark, then the next layer of bark, and then he got the nut out. Then he showed the man how to cook it weak, medium, or strong, and how to use it for 4 days. This was the way to administer it so that a person will be healed, and that is buffalo root.	
			Now water is polluted, and the water spirits aren't available when you want to pray to them.	All these medicines have their stories, how they are made, where they are found, the growth seasons. Some plants don't grow every year, they grow every two, every four years, or even 5 years.	
			Water is used in ceremonies like sun dance and sweat lodge.		

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Burtin Hutchinson	A	68	Water is greatly used in ceremony and is viewed as sacred.		The Arapaho are not an agricultural people, but they have farmed for subsistence, mainly corn, which is also used in ceremony.
			Water for people, the future generations, and is needed in that way.		
			The political system of the Arapaho was changed to be more like that of the US Government. It was changed from a Chief system to a council system. It was another way to try to wipe out our culture, through politics, but the ceremonial relationships are still respected in council.		
Wes Martel	A/S	4?	Water is referred to as the water of life.	The hydrologic cycle could represent the Tribal view of water, because water affects everything and its purity if affected by everything.	
			Water is used in ceremonies and is	The Shoshone and Arapaho people	

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			an essential part of Shoshone/Arapaho culture.	believe that water connects all portions of the natural world together, and that all things affect water.	
			Water is essential in Sun Dance, sweat lodge, and many other traditional ceremonies	Our people understand that all things, including themselves, require pure water. That is why it is the water of life.	
Don Aragon	S	4?		There is a great deal of botanical knowledge associated with the river and mountain ecosystems. This knowledge is associated with wild foods, tribal medicines, and natural herbicides.	On 4/1/98, the tribes opted to adopt the states of WY's water quality standards, which have not yet been adopted by the EPA.
					NEPDES permits on the reservation are currently state permits but, the tribes are preparing the permits according to Federal standards in order to remove them from the states oversight.
Morning Star Weed	S	80s	We have many uses for water in our ceremonies. This is one way that we use our water, in ceremonies of	Some of our plants are in the mountains, and some are along the creek. Sage is by the river and we	We really respected water and when we see the rivers and water being contaminated, it hurts us. I

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			the Native American church.	use that quite a bit, sweet sage.	know that when we are preparing for Sun Dance we offer prayers before we cut trees down to put up a lodge. When we put up the lodge, we offer prayers again. We don't just destroy things that are made by the creator. Everything is religious in that way.
			It keeps us alive; it is the water of life.	Everything needs water to stay alive. It is important for the fish and wild game, giving them something to drink and keeping them alive. Even for us, you know, water keeps us alive.	The leaders would catch specific species of fish and would eat them before they went to ceremony.
			We see water as something that we fast for, we don't drink and we pray. That is the way that they show us; the way that the creators show us things. Certain ways of showing us messages.	We know what kind of plants grows, we have those kinds of teachings from the old people.	We stayed here day after day, month after month, years after years. We don't move from city to city like other nationalities do. We don't sell out and move to other places or buy other places. We don't do that, we stay right here, year after year. We enjoy it that way. It is our homeland, and it is protected now because it is set up by treaties.

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			Water is very important to us, and to the fish. The old timers would go fishing before they went into Sun Dance.		Things have Shoshone names, the rivers, and the mountain. The rivers were named according to the trees that grew on their banks. If there were big groups of trees, a big cliff there, and the water was running near it, they would name it after the big cliff. They would also name the mountains. They named things by looking at them and appreciating them for their use, beauty, or spiritual value. If there were many bushes or willows, they would name the creek after those plants. If there was a mountain that the enemy used as a look out for the enemy tribes, then they would name that mountain that way. That is the way they used to identify the hills and the rivers.
			Water is very important in sweat bath, we use water in there too. That is the way we use it. It is very important.		

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			We really respected water and all the things that grow, the trees, and the pine trees.		
			They used to fast and could offer prayers along the river. Then the Indians would put little gifts around the rivers edge.		
			Our people use it ceremonially, but the other side, what kind of a background do they use the water for? They are not really like us, I just hear that they use it for agriculture, but the ceremonial uses of the river are not done on the other side.		We named the rivers and the lakes too. If a lake was shaped like a moccasin, it would be called moccasin lake. There is a lake in mosquito park, which was named because of all the mosquitoes. Bull Lake got its name from the water buffalo. Our tribe used to hear water buffalo make noise there at night, so they named it after the water buffalo. The white people just called it Bull Lake and left out the Water Buffalo out of it. The Shoshone name for the Big Wind River was Big River (he says the Shoshone name).

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					Some of the Indian farmers had their own ditches. We have a few canals here now that are run by the BIA, and they charge us for water. We are not supposed to pay for water, but they charge us.
Merl Haas	A	40s	I am no expert on water. I just know the importance of it to our people, and to the communities.		There are certain times of the year that the tribal people go hunting up in the mountains where the water originates from, like right now, before the Sun Dance ceremonies. They also have their regular hunting season. Some families don't have work, so hunting season is actually a time when they must still hunt for subsistence. It is a lot different then the way non-Indians look at hunting for trophies.
					Future use to tribal people is not recreation, back packing, or canoeing; future use is clean water, clean land, and clean air for future generations and wildlife.
Theresa White	A	57	We can give you an idea of how	We do have our medicines around	The protection of our water needs

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			water is perceived, but not for the specifics of what we believe is in the water. There is medicine in the water that we use. To write down that information, even the council has to go before the spiritual elders and the ceremonial elders to get permission.	the water, but I am not authorized to tell you about that, and it would be foolish if I did. We still define ourselves as an oral culture because the true Arapaho doesn't write things down. True Arapaho.	to be the main effort of the Arapaho people. In the water negotiations, tribal elders need to be sitting on the commissions.
			Medicine flows along the water.	In and of itself, it is just the idea of mother earth water nurtures her, helps her to grow her grass, gives growth to her trees, and her flowers. The water is important; it is essential, even to our bodies, which are mostly comprised of water.	Our culture has taboos. There are taboos that prevent us from doing things. I think that we have broken some taboos recently by writing down the Arapaho language, and in our water negotiations.
			I can tell you what water means; it is the water of life. Water is in our ceremonies. We even deprive ourselves of water by fasting.		When we try to harness natural resources, Mother Nature, we change civilization.
			In our Peyote meetings, we use water a lot. We even have a water woman position.		

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			So you know that water is important and it has a spiritual quality to it, there is a spirit that belongs to the water.		
			God made a water bird. I don't what it is called in the white man way, but we have a water bird. The water bird is the overseer of our water and takes care of the water. In the Peyote religion, we believe in the water bird.		
			We use water to bless ourselves all the time, but so have many other cultures and civilizations throughout the ages. They also used water this way.		
Stanford Addison	A	40	In the sweat lodge, it is considered the gift of life, that is what it represents, the water of life. In the old days, they would get the water out of the river for sweat lodge, but now we use water from the tap because we don't know if the water in the river is pure. In sweat lodge,	All these things tie together and that water is the most important thing to all life, religion, livelihood. All things are connected to that water. That is why when we are in that lodge we offer some back to the earth before we take any ourselves. That is so	They used to use different way of maintaining things, way back when. If they needed water at a certain place and if it was getting too dry or barren, they would trap a couple beavers and put them in that area and let the beavers do it.

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			you don't just cleanse your body and your mind, you cleanse your spirit. You cleanse your spirit of guilt and pain, as soon as you find the sincerity in your heart, you start trying to live it in your everyday life. When you use traditional medicines, it is the spirit that is in them, that is why we have to take them through a sweat before we use them. We put the spirit of that medicine in them so the healing power is stronger. Tribal people are just the keepers of this knowledge, it is for all people, and the creator gave us this knowledge for everybody that needs the help. Not everybody can put the spirit into these medicines, the creator appoints those that can.	we know we will reap it, because we are restoring it back to the earth.	
			Water, fire, the earth, and our lives, life was created through these four elements.	The area around the river is important for some of our medicinal plants. For example, the cotton wood tree needs a lot of water to keep growing. There are some other plants, but I don't	Everything that breaths air and drinks water has a spirit, and in order to maintain the spirit of the people we need to keep the water pure.

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				know their technical names.	
			There are some things associated with water that would be helpful for you to know. Unfortunately, I can't be the one to tell you because it is traditional and should be told by one of our spiritual elders.	The medicinal and ceremonial plants move around, they don't grow in the same place each year. There is this one plant that is for your kidneys and bladder. I found a whole bunch of it up here a couple years ago. I went back to that place this year to get some, but there wasn't any. Instead, I found some down along the river. It grew close to the river, but I thought it only grew up in the hills.	Tribal farmers never had dams in the past. When they needed water, they used the beaver technique to conduct the water and make it go where they wanted it too.
			Traditionally water is very important, important to our ways, to our Sun Dance. When you go to fast, you realize how precious and important water is to your everyday life. We take so many things for granted and never give thanks and water is way up on the list. Because when you fast, you only	It is harder to find the plants because the livestock don't let them grow to full bloom. They eat them before they grow. It is hard to find some of the plants, especially those that grow right along the water. That is where everybody wants their animals grazing.	It has always been part of our tradition to maintain the purity of the water.

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			crave food for a little while but the craving for water never leaves, it is with you until you come back.		
			Water has always been used in our traditional stories. They tell this story about a man who walks along the river. He is always along the river when the important events of his life occur.	The purity of the water is what generates that life again. If the water is not pure, even the smallest creatures will suffer. Everything depends on the purity of water, and the smallest creature is part of everything too.	Water is looked at as a commodity by non-Indian people, but we look at it as part of life. It is hard to put a value on life, so it is even harder to put a value on water.
Sandy Addison	A	33	There is still respect of the tradition that we hold on to in our lives. Tradition is what gives us an understanding of one and other, it allows us to maintain both worlds that we live in. This is because there is our traditional world and the white world. These two worlds also exist with respect to water and the way we use it.		
David Ferris	S	55	Culturally, the water is always in stories. It is used in all the ceremonies as blessed water.	Consider the hydrologic cycle as far as the importance of water and the cycle water goes through. I would imagine that the water	50 percent or more of the flow in our canals and delivery systems is lost to leakage because we don't have them lined with concrete.

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				cleanses itself of pollutants at some point but eventually it becomes saturated.	We have wood head gates that deteriorate. You can go on and on with these problems but that is what you are faced with already. So, it is kind of difficult.
			I am familiar with Sun Dance. It is a cleansing ceremony that is done yearly. You go through a series of 3 days or 4 days, what ever is designated, without water and food. During the fast you go through phases of your lack of water and food. When the fasting is over, water is brought in at a certain time. It is blessed and mixed with a certain type of clay to quench your thirst. You think about that when you are in there as a participant and you learn not to take everything for granted, to appreciate everything. It is not just water that you learn to appreciate, but everything that it effects, and everything that is tied to it.	And you know it is important for the creatures and the fish.	The government told us we were farmers. In Riverton, Lander, Freemont County, and Wyoming, farming and agriculture are ingrained in the culture, it is what people here expect you to be. They believe that the land and water are for the cow. But it is not ingrained in the Indian, we were never taught to be farmers, and we aren't.
			It is used in social dances, and some	You have to think about the	It goes back to the culture. Do you

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			healers will use it as an offering in other ceremonies.	ceremonial. None of our plant would have life if there were no water. It all ties back to water.	treat water as money? Most tribal people don't see water as money. It is hard to sell the water because it is part of Mother Earth. The same with the land. With European culture, every square inch of land is owned and accounted for.
			In some different ceremonies, there is a person who is called a water man or the water woman.	If you have a land base where you have lived forever, you will be culturally attached to that land in a holistic way. You will have an earthy approach, and a connection to the earth and the water. You will have a holistic understanding of it all.	As a child, we lived on the river, hunting and fishing for food. We learned to appreciate the mountains, the purity of our surroundings, and the water.
			As far as the tribe, they use water in different ways to survive.		We sure have to protect water. Think of my grand kids. I think that is another key here. You experience your kids, then your grandkids and them you start thinking about what it is going to be like for them. That is when you really begin to respect and understand everything.

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			All and all I think that all people that are tied to the earth and value water. You could live on concrete and turn on a faucet, but if you live on the reservation you become culturally attached. You adapt to the situation, the climate, and the water, Our culture was formed in that way.		
Harrison Shoyo	S	72	The spirit of water is the most important thing.		The rain, the snow, the wind, and the way that the land responds to them occur in a way the creator controls. The tribes are related to the land and they use the land, they are connected to the land and respect the land because it was given to them by the creator.
					It is wrong that we should have to pay for the water used for irrigation, it goes against what they we know, what we learned. Water isn't a commodity.
					I worked on the building of the

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					water treatment plant in Ft. Washaki in the early 60s. It was a difficult thing for me to do because we believed that treatment killed the water and removed the life, rather than purifying the water. It removed the spirits of the water, and would therefore make people sick. Tribal people did begin to get sick at that time because the water was treated with chemical. Eventually people became used to drinking the dead water.
Anna Maria Shoyo	S	74	The purity of water is essential and the water belongs in the landscape, rather than in well and the tap. Now, like all other aspects of life, water has become a simple commodity that can be taken easily in the home. Everything has been made easy and therefore things are not necessarily respected as they used to be.		

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