

## **Navajo Culture and Forestry Works**

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### **Origins and Beliefs**

Navajo culture provides a story of four worlds to explain their origins. The story can be told with numerous variations, but all agree on the following outline: The first world (black world) is where various spiritual beings began life and is where they were given names describing insects and animals. Altse Hastiin (first man) and Altse Asdzaa (first woman) were also created in this world. The beings were unable to live together in harmony so they passed through an opening in the east and entered the second world.

Beings and animals that were in constant disagreement occupied the second world, the blue world.. First man and first woman faced tremendous hardships here, and crossed into the third world with the bluebird and coyote through an opening in the south. In the third world (yellow world) first man and first woman encountered great rivers flowing from east to west and north to south. Coyote stole water from the great rivers, which caused a great flood. To escape the rising waters the spiritual beings along with first man and first woman they climbed a reed that extended into the fourth world through an opening created by locusts.

The fourth world (white world) was inhabited by beings that required the locusts to pass tests of character before the any beings from the third world could enter. The locusts passed the tests and all were allowed to enter the fourth world. In this world first man and first woman formed four sacred mountains with sacred dirt they had brought from the first world. These mountains represent the four directions. (story as told by Peter Iverson in “For Our Navajo People”.)

The east is the direction of the dawn and of thinking. It is a reminder to think before acting on anything. The south is associated with planning. The west is life, and where life is lived. In the west one acts on the plans of the south and thoughts of the east. To the north is where one evaluates his or her life to determine how to make it better.

It is believed that in order for a Navajo to be a well- balanced individual, each person must be disciplined in the four values of life. These values include life, work, relationships and respect. Only when a Navajo has attained all these qualities, can he or she live in harmony with the world that surrounds them.

### **Early Navajo Life**

The Navajo People or, *Dine* as they refer to themselves, comprises the largest group of Indians residing in North America. Having originally lived in what is now Alaska and northwestern Canada, the Navajo filtered southward and establish permanent settlements in the southwestern United States primarily in the New Mexico and Arizona areas. The early Dine people lived in hogans, which are simple wood framed homes covered in tree bark and mud. These dwelling were always built facing east so as to receive the early morning sunlight. Some traditional Navajos still live in these light- framed structures today. Neighboring Pueblo Indians taught the Navajos an agricultural form of subsistence with the cultivation of corn, beans and squash (otherwise known as the three sisters).

Along with their new understanding of agriculture the Navajo people used a variety of herbs and other forest products to supplement their diet. Herbs native to these forests include; Aster (ni ii nilts ooz), found in the mountain region and used for relief of headaches and toothaches, Larks Spur (tadidiin dootl izh), found in the forests and used to kill body lice, and

Nightshade (naaltsoi), which can be found in the Tsaile area and is used to treat sore throats. (Herb uses and Navajo translation provided by Carroll Ballow.) Since their earliest days of residence in the American Southwest the Navajo have utilized the forests in many every day aspects of life from medicine, cooking, and religious rituals. This dependence upon the bounty of the forests makes it unlikely that the natives would have ever willingly traded it to European settlers.

It must be said that the Navajo people were in some form or another driven from the territory they chose to reside in by false promises and sometimes, brute force. Between 1863 and 1868, under the leadership of Kit Carson, white settlers participated in massing nearly seventy-five percent of the native Navajos, and forcibly marching them to selected camps in New Mexico, camps like Fort Sumner. Many of the surviving Navajos chose to leave the camps after a period of years and began to settle back in the territory they had lived on prior to the forced exodus. The returning Indians also took refuge in Hopi territory, against that tribe's wishes. The Hopi complained of the Navajo trespassers to no avail. After many years of re-settlement by the Navajo the U.S. government was inclined to make new treaties with the Indians. (McNitt, Frank.)

### **Treaties**

Throughout the past, specifically the nineteenth century, the Navajos entered into many treaties with three distinct nations; Spain, Mexico and the United States. The Spanish Era (1805 – 1822) produced treaties that gave Spaniards claim to the land the Indians lived on, but allowed the Navajos to retain their rights of planting, stock-raising, and commerce on these lands.

The Mexican era (1823 – 1839) treaties no such promises, and were based primarily along the lines of maintaining a peace and providing physical borders as to where the Navajo Indians may travel.

Most recently the U.S. era (1849 – present), rarely granted the Navajos any rights to ceded lands, and the rare privileges the tribe was given to these lands were in the most menial forms, and did not include any raising of livestock or planting of agriculture.

The Treaty of Laguna Negra on July 17, 1855 is a representative example of the concessions the Indians were allowed in their dealings with the U.S. government. In this treaty, the Navajos relinquished all New Mexican lands except for the areas reserved for them by the federal government, but did allow them the right to gather salt around the Lake Zuni area. In no way were the Navajo to continue to graze their herds or sow any crops in these ceded lands. Some of the more generous treaties encouraged to integrate the Navajo into the puritan lifestyle, and did offer individual Navajos a means to create an agricultural life.

The Treaty of 1868 allowed for individual Navajos to select a tract of land (not to exceed 160 acres) on the reservation as their own for use in growing food. An individual Navajo was also entitled to seed and implements for farming the first year (not to exceed \$100). He was additionally given seed and implements for the second year as well (not to exceed \$25). Such amounts were not available to the Navajos for other necessities such as clothing and textiles, and were therefore only granted an annual \$5 to purchase these goods. Such negotiations were common between the U.S. and Indian tribes during the mid to late nineteenth century. Most of the treaties made took advantage of the tribe's lack of knowledge concerning written documents and ignorance of what they were actually agreeing to.

Over time, the Navajo have been able to reclaim much of what was theirs before white settlement of the Southwest. In the Treaty of 1868, the entirety of the Chuska Mountain range, and the majority of the Defiance Plateau, were designated as areas of the Navajo reservation, against the wishes of the Hopi Indians that had wanted this land for themselves. Since that treaty the Navajo reservation has been enlarged on fifteen different occasions. The current Navajo reservation completely surrounds Hopi lands and has gained significant land concessions in the area of Big Mountain.

### **Present Day Navajo**

The current Navajo Indian reservation is twenty-seven thousand square miles large and lies in three states. The majority of this reservation is in Arizona (65.35%), with additional lands in New Mexico (27.55%) and Utah (7.10%). Collectively, the reservation is slightly larger than the state of West Virginia, which makes it easily the largest Indian reservation in the United States. (NCSE.) Due in part to the massive size of their lands, the Navajo prefer to recognize themselves as a nation, and have done so since the 1960's.

Within this nation are one hundred and ten communities with parks, monuments, rock formations and canyons located throughout its vast borders. There are two thousand square mile of mountains, ten thousand square miles of mesas and fifteen thousand square miles of deserts within the reservation. The symbolic boundaries of the Navajo Nation are the four sacred mountains that encircle the reservation in four respective directions.

To the east stands Mt. Blanca (Tsisnaajini), which rises upwards of 14,000 feet above sea level. In the south is Mt. Taylor (Tsoodzil) that reaches 11,300 feet. To the west lay the San Francisco Mountains (Dook'o'osliid), which elevates to 12,600 above sea level. Finally, to the

north is Mt. Hesperus (Dibe'nitssa) that rises 30,200 feet. All these mountainous areas are part of what is known as the Colorado River Basin.

### **Climate Zones**

The Navajo reservation lies in the Colorado River Basin and is divided into two distinct climactic zones; the upper and lower sonoran zones. The upper sonoran zone has little or no snowfall, warm summers, and an average of ten to eighteen inches of annual rainfall. The average annual temperature ranges from 50 to 65 degrees Fahrenheit. Tree species include of Western Pine, Junipers, and Scrub Oaks. Scrub Oaks seldom grow to full size, and are usually low shrubs that form dense thickets. Plants residing in this zone also include the Box Elder, Greasewood, Hackberry, and Rabbit Brush.

The lower sonoran zone is the lowest of the Colorado River Basin's climatic zones, and can be described as the "hot southern zone". There is no considerable snowfall, and only two to five inches in average rainfall. In some areas, there might be no precipitation for two to three years. Long, intensely hot summers, and average annual temperatures of 50 to 74 degrees Fahrenheit are the norm, but will vary in accordance with altitude. For every one thousand feet increase in elevation the temperature will fall three and one-half degrees. This lower zone is home to mesquites, cacti, the creosote bush, the desert thorn and the smoke tree.

The productive forestry areas of the Navajo reservation are mainly located in the Chuska Mountains and the Defiance Plateau, which are in the upper sonoran zone. This area encompasses almost 600,000 acres, with approximately 254,000 acres designated as commercial timberland. (figures as reported by Patrick Pynes in Chuska Mountains and Defiance Plateau, Navajo Nation.) The Chuska Mountain forests are home to old- growth trees that provide the most valuable timber on the reservation, and the mountains themselves are considered to

represent the male deity of the Dine religion. This provides for much controversy when timber is harvested from its slopes.

The rain that falls on the Ponderosa Pine forests is responsible for two-thirds of the annual surface water on the Navajo reservation. The majority of the Defiance Plateau lies 7,000 to 8,000 feet above sea level, and the Chuskas climb to almost 10,000 feet. Trees are hard pressed to survive below these areas of higher altitude due to the drainage of rain and snowfall that bypasses the dryer areas on its way west into Canyon de Chelly and Canyon del Muerto before finally joining the San Juan River.

### **Churro Sheep: Grazing and Textiles**

Today's Navajo culture is dependant in many ways on the Churro sheep, which rely on the grassland areas of the Colorado River Basin to survive. These sheep were first introduced to the Navajo in the early 1600's by Spanish explorers. The Indians traded with the Spanish for this hearty breed sheep and the Churro has henceforth come to the forefront of the Navajo culture.

Navajo-Churro sheep are descendants of an Iberian breed called the Churra, and were originally intended to clothe and feed Spanish armies and settlers newly arrived to America. The Churro is a hardy breed known for their adaptability to changing weather and food conditions, as well as their ferocity in protecting their young from predators.

The Navajo-Churro sheep have two layers of wool. A long outer layer made of stiff fibers, and a short undercoat that consists of a softer quality of wool. These animals are unique in that they have four fully developed horns. These sheep provide for much seasonal work as they need to be moved among grazing lands throughout the year, and additional assistance is needed during the lambing and wool shearing season in the spring. The wool that is sheared has a low lanolin

content and therefore readily absorbs natural native dyes and saves the tribe valuable time and effort. The resulting yarn is then spun into clothing and commodities, such as rugs. (Navajo-Churro Sheep at kabri.net.)

Navajo rugs are well known for their beauty and resilience to wear, and sell at premium prices for their unique handspun craftsmanship and superior fiber quality. These crafts gave Navajos of the past a means to survive the elements of nature, and provide present day Navajos a valuable income source as well as maintaining a link to the past. Tribal women dominated fiber arts like this, and they tend to own most of the sheep as well. Among these fiber arts is the practice of spinning traditional clothing, which is still worn daily by many tribe members and many others during social gatherings and ceremonies. “It is believed that before an individual can receive help from the Great Spirit, one must first wear appropriate clothing in order to be recognized” (*americanwest*). Besides the fiber that is provided to the Navajo by the Churro sheep, it also gives them a ready food source.

### **Pre-European Forest Care**

Prior to the settlement of Europeans in North America, Indian tribes across the continent set deliberate forest fires. This was done for a variety of reasons. By intentionally setting fire to selected forests the Indians were able to improve berry- growing conditions, create easier travel, and improve the habitat for the wild game they hunted. By the start of the sixteenth century, it is estimated that natives had burned million of acres of forest for use as cropland.

Navajo Indians took part in forest burning in the western United States, which created many of the grassland areas in this region. This practice of intentional burning enabled Oak and



Pine trees to populate areas previously unsuited for these types of trees. This is particularly true of Aspen, which suffers without these prescribed burns. Without human intervention, the forests will build up massive amounts of fuel that will inevitably cause catastrophic wild fires.

The result of these catastrophic fires is the presence of true Fir forests that will overtake the areas of Aspen and Ponderosa Pine stands. Forests in the Southwest have lost nearly fifty percent of their Aspen population since the early to mid 1900's, and a mixture of invading conifers has nearly doubled over the same time period. With the dramatic increase of Firs in the Southwest, comes an increased risk of high intensity fires that can wipe out entire stands of trees, and damage the very soil in which they grow. These large uncontrollable fires occurred less often when managed by the Native Indians that cleared much of the underbrush by prescribed burns, before the forests had a chance to build up an excess of fuel that would lead to catastrophic wild fires.

The low intensity fires set by the Navajos, maintained a healthy ecosystem for plant and animal alike. After settlement by Europeans, and continuing into the present, the forests in this region have been deliberately left unburned. This has been done in an effort to prevent wild fires, but has had an opposite many times devastating impact. By intentionally setting fire to these tree stands the Navajo dramatically decreased the risk of the devastating wild fires seen today. The prevailing idea that forest conservation must include efforts to prevent fires had led to the unhealthy amount of debris that has collected on the forest floors. All this debris creates the fuel that high intensity fires will feed from. It is these types of fires that can do irreversible damage to the forests of the southwestern (capitalize?) United States. There are large fire prevention efforts to this day, instead of policies that would focus on more numerous low intensity fires. After letting the forests build up dry materials for so long, it is nearly impossible to create

controlled burns today. The workload involved in clearing an area to be burned is tremendous, and there are not enough resources for this to become an adequate solution. The Navajo tribes engaged in logging this area are at risk of losing the profitable timber from the pines that grow in and around their reservation.

### **Ponderosa Pine**

One of the most abundant species of trees in America, the Ponderosa Pine can be found from the Mexican to the Canada borders. It also spans from the Pacific Coast to various areas of the Mid-West. Arizona, California, Oregon, South Dakota and Washington are all major harvesting areas for Ponderosa Pine. (Ponderosa Pine ecology and applications provided by Western Wood Products Association.)

The Ponderosa Pine will generally reach heights of 100 to 160 feet, but may grow even taller. Its bark has an easily distinguishable orange-brown color that forms in large plate-like formations. The diameter averages two to four feet. Needles are found in groups of three, are yellow-green in appearance, and may reach ten inches long. The tree's cones resemble the color of its bark, and are usually three to six inches in length, and two to four inches in diameter.

These pines grow at various rates depending upon rainfall, temperature, altitude, and richness of soil. The majority of Ponderosa Pines live for approximately 125 years before succumbing to disease, rot, or fire. Though unusual, an individual tree may survive for nearly 200 years. The preferred method of harvest of Ponderosa Pine is selective-cutting, rather than clear-cutting. This is done so that some trees remain to reseed the harvested area.

The production of Ponderosa Pines trails only Douglas and Hem-fir (**Hemlock Fir?**) in annual volume. Ponderosa has many applications such as light framing and decking. It is also

very resistant to splitting and has a high value of nail retention. Ponderosa boards are very durable for outside use as they will remain nearly unchanged by fluctuations in humidity. Another valuable aspect is Ponderosa's clean grain that has a minimum amount of knots and resin pockets, when compared with other woods.

During manufacturing, Ponderosa Pine must be dried. This is usually done in kilns, but may also be air-dried. The drying process continues until the boards reach a moisture level of 12 to 19 percent. Blue stains can occur on the boards if allowed to get too warm before optimum drying has occurred. These boards are also graded on appearance as well as structural strength. There are usually three select grades and five common grades that can be applied to finished boards, but occasionally alternate grades of board can also be available as well.

Popular uses for Ponderosa Pine include paneling and furniture woodwork, such as tables and cabinets. This is due in part to the ability of this wood to hold most types of finishes extremely well. Stains and paints do not raise the grain of ponderosa pine boards, but any knots found in the wood must be sealed to prevent bleeding. The high proportion of sapwood in this tree creates a great surface for pressure treating. Preservatives used in the treating process are able to saturate sapwood cells thoroughly. This characteristic allows for below-surface applications, and makes it one of the most universally used woods in America.

### **Douglas Fir**

Douglas Fir is the second most widely logged timber on the Navajo reservation. It is an evergreen conifer that is bountiful in the Navajo Nation. These trees grow to average heights of 200 feet, and in undisturbed old-growth forests, can reach extreme heights of over 300 feet. This averages five to six feet in diameter, but may become more robust if given several hundred years of growth.

The bark of a Douglas Fir will usually reach a thickness of four to twelve inches when matured. The mature trees produce needles that are arranged in a spiral pattern and are slightly twisted at the base, which allows the needles to lie flat on either side. Female seed cones are produced in the spring and will reach a length of two to four inches by the time they mature in autumn. The female cones develop seeds, which are then pollinated by male cones. The male cones are much smaller than their female counterparts averaging only two to three centimeters in length. Male cones contain a yellow- colored pollen that is released in spring.

Seed production has cycles, and takes place over five to seven year periods, which will produce a single heavy crop, and a single crop failure with the majority of the years yielding light- to- medium crops. Only one-quarter of Douglas Firs will actually yield a significant amount of cones, which contain twenty-five to fifty seeds. These seeds provide an invaluable source of food for the small mammals and birds that live in the surrounding area. Animals like mice, shrew and chipmunk eat an estimated 65 percent of all seeds produced by Douglas Fir.

In an unusual twist of evolution, Douglas Fir are more shade intolerant than most other species. This means that they have extreme difficulty growing in areas that don't receive a lot of sunlight. This keeps the trees from growing in stands, due to the shade provided by the canopy. Dispersal of seeds to successful growing areas is in many ways dependant upon the animals that feed on them.

Healthy logging practices assist the growth of Douglas Firs. By cutting regions of these trees, canopies now allow sunlight to reach the newly planted saplings. This is a benefit for both the Navajos and the trees. The Navajos receive the valuable timber from the mature trees, which are, in turn, ensured a successful new generation.

The timber gathered after a harvest has an infinite number of uses. The most common are structural applications, which include beam timber and pilings with additional use as plywood. From railroad ties to flooring and furniture, Douglas Fir is a multi-purpose product that can provide a stable economic foundation for the tribe if managed properly.

### **NFPI**

In 1958, the tribe created the Navajo Forest Product Industries or (NFPI), in cooperation with the Navajo Tribal Council and the Bureau of Indian Affairs (BIA). NFPI was created in an attempt to bring the Navajos a self-supporting industry and good-paying jobs. From 1962 to 1992, an average of forty million board feet of lumber were harvested by NFPI every year, and it provided a much needed economic windfall for the tribal workers. These large harvests made the NFPI the largest lumber mill in the southwestern United States by 1963. The tribe had been making great economic progression through their harvests and lumber production, but had failed to consider the importance of replanting the areas that had been cut.

Decades of forest neglect and mismanagement led to a recession for the NFPI. By the early 1980's the NFPI had become heavily in debt to the tribe, and timber harvests were reduced by 50 percent. The mill was forced to start layoffs in 1980, and its 600- strong workforce was continually reduced over the next ten years. During this time disputes between residents and logging operations plagued the NFPI and by the end of 1993, the NFPI owed the tribe \$8,000,000 with an additional \$12,000,000 to other creditors.

Since there had been virtually no replanting by the tribe between 1880 and 1975, and no plan to effectively manage remaining forests, the mill was forced to shut down entirely. When the mill was officially closed on July 25, 1994 there were 125 workers left on the payroll, many of them management personnel. Another blow was dealt when the BIA when it refused to allow

any more timber sales, until a ten year management plan could be proposed and agreed upon by the NFPI and the BIA.

### **Dine CARE**

Environmentally active citizens of the Navajo reservation began to take an interest in the logging practices of the NFPI during the early 1980's. Under the leadership of Leroy Jackson and Adella Begaye, tribal citizens spearheaded efforts to stop over-cutting of Navajo forests and save wilderness areas that were home to sacred species of animals. Thus, Dine CARE was born or (Citizens Against the Ruining of our Environment).

The Mexican Spotted Owl which is revered by the Navajo as a "sacred messenger" to warn them of danger has been protected under the Endangered Species Act of 1993 thanks in part to Dine CARE. Several strides had been made by the group in preserving their native forests, when they were dealt the devastating blow with the death of founder Leroy Jackson. He died under mysterious circumstances in the back of his van just three days before he was to meet with U.S. Fish and Wildlife Service and the Bureau of Indian Affairs in Washington D.C. (Outside Online. The cause of Leroy Jackson's death has been officially declared an overdose of methadone by authorities.)

Despite his death, Dine CARE continued on under the leadership of Adella Begaye. Dine CARE began as a small, poorly- funded organization, but grew to one that now plays a significant role in Navajo forestry operations. Through increased participation by tribal members, several key steps have been taken to ensure the sustainability of Navajo forests. One of those steps was the Draft Programmatic Environmental Impact Statement (DPEIS). The DPEIS sets guidelines for forest harvests over a ten- year period.

This DPEIS has outlined a program that allows for 79,500 acres to be harvested this ten-year period. It also promotes diversity in vegetation, by using a combination of even-age and uneven-age harvesting. The DPEIS has a provision that created nearly seventy-five thousand acres as Special Management Areas, or SMA. These areas protect wildlife and watershed areas from logging. Along with the restrictions on timber harvests the DPEIS provides almost 700 acres per year, to be subject to prescribed burns to aid in fire prevention, trespass and insects, all in an attempt to create healthy forests.

### **National Forest Oversight**

In cooperation with the Navajo tribe the United States government has taken a part of the responsibility in managing Navajo forestland. This function is for the most part conducted by the Department of the Interior specifically the BIA. It is a trust- based relationship, between the tribe and Federal Government, to control over-cutting and institute good replanting practices, while at the same time allowing the tribe to keep direct control of harvesting practices, preventive fires, and grazing.

The National Indian Forest Resources Management Act (NIFRMA) gives the Secretary of the Interior the ability to analyze an independent assessment of Indian forests and logging practices. To conduct these independent studies, seven forestry experts were chosen by the Intertribal Timber Council (ITC) to form the Indian Forest Management Assessment Team (IFMAT). IFMAT's primary focus is on tribal procedures in regards to timber sales as well as the health and management of current forests. This group's recommendations are a key component in the determining the amount of funding tribes should receive for forest management.

## Summary

The Navajo Tribe and their forestry practices are subject to several theories. First, Navajo forestry has severely neglected the sustainability of their forests in past decades. Second, there is still a chance to maintain a productive timber industry, while preserving a healthy wilderness in cooperation with tribal watch groups such as Dine CARE. Lastly, with continual use of responsible forestry techniques, the Chuska Mountain Range and Defiance Plateau could become a real leader in lumber production considering the constant demand for the quality pine products manufactured on the Navajo Nation.

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