

Forests and Climate Change

Connections among the Diné and the Forest

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Diné Institute for Navajo Educators (DINÉ)

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Author Note:

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Introduction

I am currently in my second year with the NAU DINÉ Institute. In my first year, I did a unit on Navajo people's access to clean water. My units have centered around the environment in our Navajo lands and its effects on our people. As an avid hiker and hunter, I have spent many hours outdoors within our reservation lands, which has helped me gain a better appreciation for our limited and endangered resources.

My goal is to pass an awareness of our Navajo forests on to our students in the Window Rock School District, which includes the surrounding areas of Fort Defiance, Sawmill, St. Michaels, Hunter's Point, Red Lake, and Oak Springs. These communities are near forested areas--the exception on the Navajo Nation. (Most of Navajo Nation is an arid desert with very little vegetation.) I've personally seen the changes in land and climate over the last forty years. It is of great concern, and I would like our Navajo students to gain knowledge in addressing the issues related to our forests and learn what measures will provide for the greater good through personal actions, awareness, and education. Our traditional stories gave us knowledge of the past and are meant to evolve into today's world. This lesson does not only cover forests in general, but includes lessons about the trees.

Context and Rationale

The topic, "Why is our forest so important to Navajo?" will be taught to 12th grade students in a dual enrollment credit course at Window Rock High School in Fort Defiance. This class is done in conjunction with Navajo Technical University out of Crownpoint, NM. Window Rock High School serves students from the surrounding communities of Window Rock, St. Michaels, Hunter's Point, Oak Springs, Sawmill, and Red Lake. The Window Rock Unified School District has approximately 2,000 students and is about 98% Navajo. Most non-Navajo students are the children of school district or hospital employees. There are five schools within W.R.U.S.D.: Tsehootsooi Dine' Bioltah (Navajo immersion school for grades K-6th grades), Tsehootsooi Primary School (K-3rd grades), Tsehootsooi Intermediate School (4th-6th grades), Tsehootsooi Middle School (7th-8th grades), and W.R.H.S. (9th-12th grades). This topic will take two weeks in a two-semester long class and falls under Career Exploration lessons.

Many students do not give a second thought to Navajo forests, forestry, or pursuing potential careers in these fields. The lessons of career exploration is to garner interest in working with our Navajo forests to restore and save them. By giving the students the means to comprehend the

importance of Navajo forests and their health, I hope that more students will not only be educated about forestry, but will seek work in the forestry field. The importance of our forests also follows the traditional and historical outlook of how we as Navajo people see forests as a source of the sustenance of life.

Content Objective

Economics of Studying Forestry

There has not been much growth in the Fort Defiance community. Window Rock High School students are therefore encouraged to seek higher educational opportunities outside the region. Popular, high paying jobs that students are informed of are usually in the mechanical fields, in the police department, as welders, or other manual labor jobs. Exposure to specialized areas should thus be encouraged. In turn, most students wanting further specialized jobs leave the community and the reservation, sometimes permanently. Forestry is a specialty I want them to explore. I hope to show students how studying forestry can lead to finding jobs they will find rewarding.

Cultural aspects of Forestry

It's said among the Navajo that all things in nature are part of life. Plants and trees are just as important as humans and animals. We get sustenance, building materials, shade, anchors for the landscape, oxygen, weather, and other benefits from our trees. Our forest is unique to us and our students should benefit from what it holds. Working in this area could be seen as a contemporary way to form positive interaction with our forests and environment.

Teaching Strategies

Teaching Strategy 1 (Traditional introduction)

Although most of our Navajo lands on the Navajo Nation (reservation) are desert, we have many forests. Our four sacred mountains are monumental peaks towering high above the surrounding land and these mountains have forests. It is from these forests where we get our stories, our medicine, and the materials for our shelters and ceremonies.

I will begin by asking the students, "What do you think our traditional connection with our forests was like?" Our trees such as juniper, Douglas fir, aspen, and ponderosa pine meant something to our ancestors. We will discuss how our four sacred mountains are thickly forested. These are the mountains of Mt. Hesperus (known in Navajo as the Northern Mountain) and Blanca Peak (the Eastern Mountain) in Colorado; Mt. Taylor (the Southern Mountain) in New Mexico; and the San Francisco Peaks (the Western Mountain) in Arizona. They are known in Navajo respectively as DibeNitsaa, Sisnaajini, Tsoodzil, and Dook'o'oosliid (Iverson, 2002).

We will also discuss how we gather food from the forests. An example of this would be pinon, also known as pine nuts. The Navajo have a traditional story related to pinon. The story is of Coyote, the Navajo trickster, and his marriage to Bear Woman. Coyote was killed and his widow mistakenly blamed her brothers for his death. She turned into a vicious bear (probably a Grizzly which once roamed Navajo forests but is now extinct) and killed all of her brothers except for one. When she fought the last brother, she lost. He killed her and cut up her body and threw in four directions. In one of the directions, her body turned into the pinyon pine from which Navajo people gather pinons, a common food staple. While teaching this story, I will have to take care to observe traditional storytelling times of the season. This lesson might have to be abbreviated or adjusted due to observing the seasonal changes and keeping traditional respect to such timelines.

From our forests, we take building materials for use in making our hogans, Cha'oo (shaded area), sheep corrals, bows, weaving looms, etc. Certain types of trees are used for certain structures and tools. For example, historically, willow trees were used in making bows and arrows and cottonwood trees were used to make looms and cradle boards.

The animals we hunt come from the forest. Navajo have always hunted animals such as deer, elk, and bighorn sheep, which although rare today, our Northern Navajo sacred mountain is named after this graceful animal.

I plan on letting the students try to come up with some of these aspects of the forest, but if they struggle, I will guide their answers to reflect on these topics.

Introductory Lesson

The Remembrance of the Past: An Intro lesson to Navajo Forestry

Objective: Discover what the forests/environment were like during the era of your parents and grandparents and this put into a personal narrative.

Time Frame: Two Days

The goal of this lesson is that students gain an intimate understanding of what the past environment of our immediate area used to be like. They will meet with an elder, this can include parent(s), and will write a short personal narrative essay and support it with stories. Including pictures is optional.

Students will be told to introduce this topic by asking their elders what it was like growing up in this area of Fort Defiance. The following is an example of how this conversation can begin: "Mom/Dad/Grandmother/etc., what was your youth like as far as what you saw in our forests and land?" Next, students will ask, "what differences are there now? Are these changes good, bad, or significant?" As the elders answer these questions, the student will take notes. Students will write

their findings in a one-page summary. This is a short story designed to gain a perspective the student may not have.

Lesson Two

Our Modern Environment

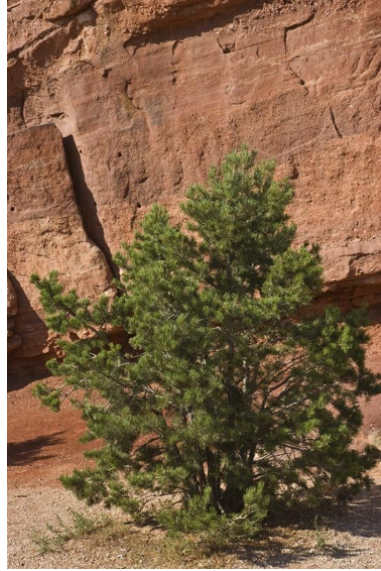
Objective: Introduce the modern environment of forests in the Navajo Nation. Provide illustrations of our forests today showing:

- 1) Cookies: cutaways of a tree such as a ponderosa pine. Called a “cookie,” these are sometimes used by forestry personnel to measure the age of a tree when it has been cut down. They can be used to illustrate to the students and are used as a historical time marker. We will mark the tree rings with important dates such as 1868 (Navajo Treaty with US Government), 1924 (the year American Indians became U.S. citizens), and 1941 (U.S enters WWII) I will explain how this tree is a natural historical timeline.



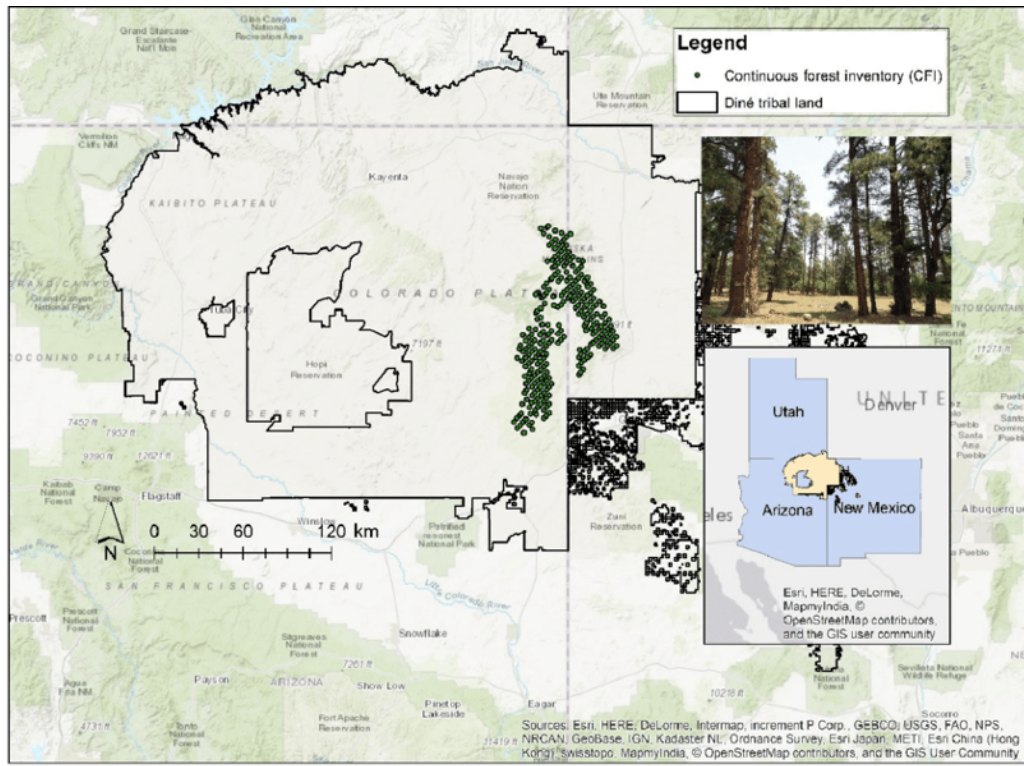
(Photo taken from NAU Diné Institute, 2021)

- 2) Specific types of trees: ask students what types of trees are present in the Navajo Nation forests. Identify illustrations of such identified trees. Example: ponderosa and pinyon pine



I will ask, “What are these two types of trees used for?” The answer is Lumber and pinon nuts.

Maps of our current Navajo forests (Yazzie et al., 2019)



As a part of this lesson, students will also be asked to locate our home area of Fort Defiance on the map and have them point out any other known locations in the area.

Lesson Three

Career Pathways

Objective: Research occupational careers and pathways to these careers through post-secondary education.

Working with Navajo forests (other than as a firefighter) is not a well-known field among our Navajo students. This lesson is to provide students with career options and to explain how to go into certain fields that work with Navajo forests. Oftentimes, students are not given options in schooling and careers. This teaching strategy is meant to be informative not only in what occupations are available, but also informs students on the path to become eligible for these careers. Jobs and their descriptions will be examined as well as post-secondary institutions and various majors of study. I will also discuss the various departments under the Division of Natural Resources they can go into on Navajo Nation.

Listed as jobs with Navajo Nation government, these related careers are:

1. Navajo Forestry (contact phone number: 928-871-6540)
 1. Forester
 2. Range Specialist
2. Water Resources (contact phone number: 928-729-4003)
3. Fish and Wildlife (contact phone number: 928-871-6450)
 1. Natural Heritage
 2. Botany
4. Department of Agriculture (contact phone number: 928-871-6605)
 1. Range Specialist
 2. Agronomist
5. Navajo Environmental Protection Agency (contact phone number: 928-871-7692)
6. Abandoned Mine Lands (AML) (contact phone number: toll free at 1-866-458-4390)
7. Historic Preservation (contact phone number: 928-871-7198)
 1. Cultural
 2. Archeologist
8. Air/Water Quality (contact phone number: 928-729-4246)
9. Minerals (contact phone number: 928-729-6588)
 1. GIS (Geographic Information Systems)
 2. Computer
 3. Data Collection
10. Parks and Recreation (contact phone number: 928-871-6647)
11. Regional Fire Management (contact phone number: 928-729-7230)

There are other agencies within the county, state and federal government, but due to time and convenience, only the local office of US Forestry- Fort Defiance Agency will be included in my lesson plan.

Apart from working in any of the departments within Navajo Nation Government listed above, the fields that involve work with forests can also include studies in:

- 1) Forestry-A specialized degree offered at numerous universities and colleges, the closest of which are Northern Arizona University in Flagstaff, AZ, Fort Lewis College in Durango, CO and at New Mexico Highlands University in Las Vegas, NM.
- 2) Biology-The study of an ecosystem characterized by large numbers of plants and animals
- 3) Geology- The study of forest ecosystems and the environmental factors and processes (biological, physical, and chemical) that affect them.
- 4) Chemistry-The study of natural products from within the forest and also how chemicals can affect forests.
- 5) Geography-The study of forests and their impact on Navajo land (and throughout the world) by affecting our air, weather, and climate.
- 6) Environmental Science-The study of understanding the environmental factors which affect forests.
- 7) Physical Science-The study of soil factors and micro-climates (temperature, precipitation, and wind).

Most of our students do not know many of these areas of study and my hope is that this will help guide them through mini lessons in Navajo culture and environmental awareness, specifically in relation to climate change, potential careers in working with our Navajo forests, areas of study (college majors) and institutions of study. The majors listed in items numbered two through seven can be found at most colleges and universities, but Forestry is found only at certain institutions. I hope to also include guest speakers from the Navajo Nation and from post-secondary institutions to speak and interact with our students. Reflecting back on my own schooling, I was not always aware of the possible choices in careers and think this curriculum will help today's high school seniors with choosing a career that not only plays to their interests but is also something that could help their community.

The curriculum for the dual credit class, College Success Skills, is wide open in what students do as far as their assignments. This will involve research in career choices and also within forestry itself. Writing and critical thinking will also be a part of the assignments. This curriculum will be one of two career options the students will be able to partake in. The other will be teaching in a public school, another area Navajo Nation is significantly understaffed in.

Classroom Activities

Lessons should take place over a two-week period. Much of the time will be spent on research on careers and post-secondary schooling.

Student Assessment Plan

Students will research one occupation from these fields:

1. Navajo Forestry
 1. Forester
 2. Range Specialist
2. Water Resources
3. Fish and Wildlife
 3. Natural Heritage
 4. Botany
4. Department of Agriculture
 5. Range Specialist
 6. Agronomist
5. Navajo Environmental Protection Agency
6. Abandoned Mines Lands (AML)
7. Historic Preservation
 7. Cultural
 8. Archeologist
8. Air/Water Quality
9. Minerals
 9. GIS (Geographic Information Systems)
 10. Computer
 11. Data Collection
10. Parks and Recreation
11. Regional Fire Management

They will choose the career that most interests them and will list what educational steps are required to attain that position. They will then present this as a PowerPoint to the class. The presentation will have the following:

1. The career and department the specific occupation falls under.
2. A list of the educational degrees and majors required for this profession.
3. Demonstrate basic knowledge of the job description of their career and potential for growth.

Alignment with Standards

AZ State Standards

English Language Arts Standards 11-12th Grade

Research to Build and Present Knowledge

11-12.W.9 Draw evidence from literary or informational texts to support analysis, reflection, and research. B. Apply grades 11-12 reading standards to informational text and nonfiction.

Speaking and Listening Standards

Comprehension and Collaboration

11-12.SL.2 Integrate multiple sources of information presented in diverse media and formats in order to make informed decisions.

Presentation of Knowledge and Ideas

11-12.SL.5 Make strategic use of digital media in presentations to enhance understanding of findings, reasoning, and evidence to keep the audience engaged.

Conventions of Standard English

11-12.L.1 Demonstrate command of the conventions of Standard English grammar and usage when writing or speaking.

11-12.L.2 Demonstrate command of the conventions of Standard English capitalization, punctuation, and spelling when writing. B. Use correct spelling.

Knowledge of Language

11-12.L.3 Apply knowledge of language to understand how language functions in different contexts, to make effective choices for meaning or style, and to comprehend more fully when reading or listening. Vary syntax for effect, consulting references for guidance as needed, apply an understanding of syntax to the study of complex texts when reading.

Vocabulary Acquisition and Use

11-12.L.4 Consult general and specialized reference materials (e.g., dictionaries, glossaries, thesauruses), both print and digital, to find the pronunciation of a word or determine or clarify its precise meaning, its part of speech, its etymology, or its standard usage.

11-12.L.6 Acquire and accurately use general academic and domain-specific words and phrases sufficient for reading, writing, speaking, and listening at the college and career readiness level.

Demonstrate independence in gathering vocabulary knowledge when considering a word or phrase important to comprehension or expression.

Career and Technical Education (CTE)

Strand 1: Creativity and Innovation

Concept 1: Knowledge and Ideas. PO 1. Analyze, evaluate, and synthesize information to generate new ideas, processes, or products.

Concept 2: Models and Simulations: use digital models and simulations to examine real-world connections, explore complex systems and issues, and enhance understanding.

Strand 2: Communication and Collaboration

Concept 1: Effective Communications and Digital Interactions communicate and collaborate with others employing a variety of digital environments and media.

Strand 3: Research and Information Literacy

Concept 1: Planning strategies to guide inquiry. PO 1. Identify and defend effective keywords, phrases, and strategies for conducting information searches. PO 2. Evaluate diverse information sources.

Concept 2: Process locate, organize, analyze, evaluate, synthesize, and ethically use information from a variety of sources and media. PO 1. Locate and synthesize information utilizing advanced search strategies including a variety of search engines, metadata search engines, deep web searches. and databases.

Strand 5: Digital Citizenship

Concept 1: Safety and Ethics Advocate: practice safe, legal, and responsible use of information and technology. PO 1. Determine when it is appropriate and safe to use various personal digital devices. PO 2. Describe strategies to deal with cyber-bullying situations. PO 3. Advocate and practice safe, legal, and responsible use of digital tools as defined by school board policy and procedures. PO 4. Demonstrate safe online communication practices regarding personal information. PO 5. Analyze and compare how web advertising influences consumer choices. PO 6. Advocate and exhibit legal and ethical behavior when using technology.

Strand 6: Technology Operations and Concepts

Concept 1: Understand, recognize, define, and use technology processes, systems, and applications.

Diné 9-12 Standards

Standard: I will develop an understanding of Diné Way of Life

Concept 2: I will apply and practice the Diné way of life with confidence.

PO3 I will practice the respect of nature in my daily life.

Concept 3: I will implement and recognize the Diné lifestyle.

PO2 I will research stories relevant to land and water.

Resources

Navajo Nation Government Websites:

_Navajo Nation Forestry, <https://www.dnr.navajo-nsn.gov/Departments>

Water Resources, <https://www.dnr.navajo-nsn.gov/Departments>

Fish and Wildlife, <https://www.nndfw.org/>

Navajo Environmental Protection Agency, <https://www.navajonationepa.org/>

Department of Agriculture, <https://www.agriculture.navajo-nsn.gov/>

Abandoned Mine Lands, <https://www.aml.navajo-nsn.gov/>

Historic Preservation, www.hpd.navajo-nsn.gov

Air Water Quality, <http://www.navajonationepa.org/aqcp/MoreInfo.html>

Minerals, <https://www.dnr.navajo-nsn.gov/Departments>

Parks and Recreation, <https://navajonationparks.org/>

U.S. Government Websites:

Regional Fire Management, Department of the Interior, Fort Defiance Agency,
<https://www.bia.gov/regional-offices/navajo/ft-defiance-agency>

Public Universities:

Northern Arizona University, Flagstaff, AZ <https://nau.edu/>

New Mexico Highlands University, Las Vegas, NM <https://www.nmhu.edu/>

Fort Lewis College, Durango, CO <https://www.fortlewis.edu/>

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