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Commenter: Llevando Fisher

Organization: Northern Cheyenne Tribe

State: Montana

Agency: Surface Transportation Board

Initiative: Tongue River Railroad

Submission Text

Please see the attached comments of the Northern Cheyenne Tribe on the Tongue River Railroad Draft Environmental Impact Statement. Due to file size constraints, the Tribe has not included the referenced appendices in the electronic submittal but has sent a hard copy of these comments by U.S. mail that includes the referenced appendices.



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The Morning Star

**NORTHERN CHEYENNE TRIBE
ADMINISTRATION**

P.O. Box 128
LAME DEER, MONTANA 59043
(406) 477-6284
FAX (406) 477-6210



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The Morning Star

September 23, 2015

Ken Blodgett
Surface Transportation Board
395 E Street, S.W.
Washington, DC, 20423
ATTN: Office of Environmental Analysis, Docket No. 30186.

Re: Northern Cheyenne Tribe's Comments on the Draft Environmental Impact Statement for the Tongue River Railroad.

Dear Mr. Blodgett,

The Northern Cheyenne Tribe ("Tribe") is a federally recognized Indian tribe that occupies the Northern Cheyenne Reservation ("Reservation"), which encompasses over 444,000 acres of land in southeastern Montana. Pursuant to the National Environmental Policy Act ("NEPA"), the Tribe submits these comments on the Draft Environmental Impact Statement ("DEIS") for the Tongue River Railroad ("TRRR" or "project"), which the Surface Transportation Board ("STB") released on April 17, 2015.

I. Introduction and Summary

The proposed TRRR, the Otter Creek Mine, and other mines potentially induced by the TRRR, are in close proximity to the eastern boundary of the Reservation, and are within the ancestral territory of the Northern Cheyenne people. There are sizable on-Reservation Tribal populations in the towns of Ashland and Birney, both of which are in close proximity to the project area. Because the TRRR and the potentially induced mines are within the Tribe's ancestral territory and are directly adjacent to the Reservation itself, the Tribe is dismayed that the DEIS fails to take a "hard look" at the impacts to the Tribe and the Reservation that could result from the TRRR.

The Tribe is concerned that the project will have severe adverse impacts on the Tribe's members and the Reservation environment, and will irreversibly degrade the traditional way of life practiced by the Northern Cheyenne people since time immemorial. As discussed below, information provided in the DEIS indicates that the project will adversely affect air quality, water quality, biological resources and wetlands, cultural resources, and other resources that are important to the Tribe. In addition, the project threatens to impact the health of tribal members, a population that already has significant health concerns, and may cause increased crime in Reservation communities that already suffer for disproportionately high crime rates. Although the Tribe's scoping letter raised these concerns and requested that the STB conduct a thorough assessment of potential impacts to the Tribe, the analysis in the DEIS is flawed and inadequate and fails to give the Tribe confidence that the STB is adequately protecting its interests.

LITTLE WOLF AND MORNING STAR – Out of defeat and exile they led us back to Montana and won our Cheyenne homeland that we will keep forever.

One of the most glaring omissions in the DEIS is the STB's failure to conduct a meaningful analysis of the socioeconomic impacts to the Tribe and its members that would result from the project. Although the STB acknowledges that the TRRR and coal mines induced by construction of the TRRR would bring thousands of new residents into the region, the STB abdicated its responsibility to assess how this significant population increase would impact Tribal interests such as on-Reservation housing, crime rates, public services, and cultural integrity. The failure to consider such impacts is especially egregious because the Tribe and its members are unlikely to receive many of the economic benefits forecasted in the DEIS that might otherwise offset some of the socioeconomic impacts. The deficiencies in the DEIS relating to socioeconomic impacts to the Tribe are detailed below in Section IV.a and in the report of Power Consulting Incorporated, attached as Appendix A.

The DEIS is also deficient in its assessment of impacts to cultural resources in the project area. In particular, as described in Section IV.b and in Appendices B and C, the STB failed to identify numerous culturally significant sites that may be impacted by the proposed project. There are also significant flaws with the documentation of cultural sites that were identified during the cultural resources survey work performed for the STB. The failure to accurately identify and document cultural resource sites in the project area is inconsistent with the STB's obligations under NEPA and the National Historic Preservation Act.

The Tribe also has significant concerns regarding the adequacy of the air quality and coal dust analyses in the DEIS. As detailed below in Section IV.c and in the report of Dr. Ranajit Sahu, Ph.D., attached as Appendix D, the DEIS appears to dramatically underestimate the potential coal dust emissions that could result from construction and operation of the TRRR. In addition, the air quality and coal dust assessments suffer from a lack of transparency and failure to provide support for numerous assumptions and limits adopted by the STB. As a result of these flaws, the DEIS fails to provide a reliable evaluation of the potential environmental and human health impacts from coal dust and other air pollutants caused by the TRRR.

The DEIS also inadequately analyzes potential impacts to surface water quality in the Tongue River and its tributaries. The Tongue River forms the eastern boundary of the Reservation and, pursuant to the federal Clean Water Act, the Tribe has delegated federal authority to establish water quality standards and issue water quality certifications on the Tongue River. There is no indication in the DEIS that the STB evaluated whether water contaminants discharged during the construction and/or operation of the TRRR and related projects (including the induced mines) will interfere with the Tribe's ability to achieve or maintain its water quality standards, interfere with any of the tribally-designated uses of potentially affected surface waters, or violate the Tribe's anti-degradation policy. The Tribe's concerns regarding impacts to water quality are detailed below in Section IV.d, and the Tribe's current water quality standards are attached to this letter as Appendix E.

In addition, as discussed below in Section IV.e, there are significant flaws in the STB's analysis of potential impacts to wetlands and hydraulic conditions. The methodology the STB used to categorize wetlands in the project area is not well suited for use in eastern Montana and likely underestimates the value and function of wetlands in the region. In addition, the wetlands

analysis fails to document culturally significant plant species found in wetlands in the project area, and the DEIS fails to propose mitigation measures that will adequately address risks to wetlands such as invasion of noxious weeds and loss of wetland diversity. The report of Geum Environmental Consulting, Inc., attached as Appendix F, details many of the flaws in the wetlands assessment in the DEIS.

The STB also appears to have made no effort to assess the impacts of the Project on biological resources the Tribe relies on for cultural and subsistence purposes. While the project area contains numerous culturally important plant species that would be impacted by the TRRR, the STB made no attempt to identify such plant species, assess the potential impacts, or develop mitigation to compensate the Tribe for the loss of access to these important plant species. Likewise, the DEIS does not assess or attempt to mitigate potential impacts to the Tribe's subsistence hunting and fishing practices in and near the project area. The Tribe's concerns relating to culturally important plant and animal species are discussed below in Section IV.f.

Furthermore, as discussed in Section IV.g, the DEIS fails to adequately assess the environmental impacts that would result from a catastrophic event during construction or operation of the TRRR or the induced mines. For example, a major train derailment along the Tongue River or a large fire triggered by operations could cause impacts to air quality, water quality, and biological resources far in excess of those disclosed or evaluated in the DEIS. Fire risk on the Reservation is discussed in the BIA's 2009 Forest Management Plan, attached as Appendix G. Additional information regarding the importance of forest land to the Tribe and its susceptibility to fire is included in Appendix L. While the Tribe acknowledges that the likelihood of such an event may be low, the potentially severe consequences of such an event must be addressed in the DEIS to allow the decision-makers to fully assess the project risks.

Finally, the STB's conclusion in the environmental justice section of the DEIS that the only "disproportionately high and adverse human health or environmental effects" to the Tribe would be noise impacts is not supported by the analysis in the DEIS. As detailed below in Section IV.h, the STB failed to take a hard look at the many ways in which the Tribe could be impacted by the proposed project, and thus had no rational basis to evaluate the magnitude of such impacts or determine whether such impacts would be "disproportionately high and adverse."

In sum, the DEIS fails to evaluate many ways in which the TRRR could significantly and disproportionately impact the environment, traditional culture, and way of life of the Northern Cheyenne people. The STB's failure to fully assess these impacts to the Tribe violates NEPA and the STB's fiduciary obligations to the Tribe.¹

¹ On September 21, 2015, the Northern Cheyenne Tribal Council unanimously approved a resolution opposing the railroad and stating that the Tribe "believes that the direct and long term cultural and environmental impacts of the proposed Tongue River Railroad Project will be devastating to the local communities on or near the Northern Cheyenne reservation[.]" A copy of this resolution is attached to this letter as Appendix K.

II. Background and History

The project area is within the traditional homeland of the Northern Cheyenne people. The Tribe has a long history of fighting to protect its traditional way of life on these lands, which has been under threat for centuries. It is important for the STB to appreciate this historical context, summarized below and discussed in much more detail in the referenced documents, as it evaluates whether to permit construction of the TRRR on traditional Tribal lands.

Beginning in the early 1800s, large numbers of settlers and gold seekers began to move into southeast Montana. These early settlers and miners brought with them diseases that ravaged large numbers of Cheyenne people. They also brought European cattle, which began to disrupt the grazing and migration patterns of the buffalo, which the Northern Cheyenne relied on for subsistence and ceremonial purposes. *See infra*, Section IV.f. These encroachments, which did not respect the territorial and cultural interests of the Cheyenne and other Indian people, resulted in decades of war. *The Northern Cheyenne Tribe and Its Reservation* at 2-12 (Apr. 2002).²

In the mid-1800s, there were numerous attempts to remove the Northern Cheyenne from their homeland near the Tongue River and relocate them to other parts of the west. For example, the 1851 Treaty of Fort Laramie anticipated the removal of the Cheyenne to lands south of the North Platte River; however, following treaty execution, many Northern Cheyenne people continued to live and hunt in their traditional homeland, leading to escalating conflict and violence in the 1850s. In 1861, the U.S. government again attempted to relocate the Northern Cheyenne to the south, but the Northern Cheyenne refused to abandon their traditional hunting grounds and continued to resist the commercial and military intrusions into their territories. Conflict continued into the 1870s, as the U.S. military sought to open the Cheyenne lands to settlers and gold miners, and the Northern Cheyenne sought to protect their lands and traditions from encroachment. These conflicts include the 1876 Battle at Little Big Horn, where the Northern Cheyenne allied with the Sioux and Arapaho to defeat General George Armstrong Custer and the U.S. Seventh Cavalry. They also include the Battle of the Tongue River in 1877 (also known as the Battle of Wolf Mountain), where a group of Northern Cheyenne battled a detachment of the Fifth Infantry in the project area, along the east bank of the Tongue River near the present day location of Birney. Following these conflicts, many Northern Cheyenne were forcibly relocated to Oklahoma. *The Northern Cheyenne Tribe and Its Reservation* at 2-12 to 2-17.

The Northern Cheyenne resisted these repeated attempts to remove them from their homeland, and have maintained their connection to the lands near the Tongue River. In 1878, following the relocation to Oklahoma, Chief Dull Knife and Chief Little Wolf led bands of Northern Cheyenne on a long and arduous return trip from Oklahoma to their traditional homeland. In the late 1870s and early 1880s, the Northern Cheyenne began to reestablish themselves in areas near the Tongue River, settling on Lame Deer Creek, Muddy Creek, Rosebud Creek, and the Tongue River between Otter Creek and Hanging Woman Creek.

² The volume entitled *The Northern Cheyenne Tribe and Its Reservation* (Apr. 2002) was submitted in its entirety to the STB with the TRRR scoping comments the Tribe submitted in January 2013, and is incorporated by reference into this comment letter.

Recognizing the importance of this area to the Cheyenne people, President Arthur signed an executive order on November 16, 1884, establishing the Tongue River Indian Reservation, which at that time did not include lands settled by the Northern Cheyenne on the Tongue River itself. However, in 1900, President McKinley signed an executive order changing the name of the Reservation to the “Northern Cheyenne Reservation” and extending the eastern boundary of the Reservation to its current location on the Tongue River. Weist, Tom, *A History of the Cheyenne People*, at 103-105 (1977); Orlan J. Svingen, *The Northern Cheyenne Indian Reservation, 1877-1900*, at 145-146 (1993); *The Northern Cheyenne Tribe and Its Reservation* at 2-17 to 2-19.

Despite establishment of the Reservation, Northern Cheyenne lands and culture remained under threat throughout the 20th century. The early 1900s saw the forced acculturation of the Northern Cheyenne people through federal policies that prohibited or discouraged traditional cultural and religious practices and sent Cheyenne children to boarding schools where they were forbidden to speak their native language. In the mid-20th century, mining companies began to express interest in developing coal reserves on the Northern Cheyenne Reservation. The first coal sale on the Reservation took place in 1966, and by 1971 lease options were held by mining companies to virtually the entire unallotted portion of the Reservation. However, review of these leases revealed that the financial terms were below fair market value and the leases were issued in violation of various federal laws, including NEPA. In 1973, the Northern Cheyenne Tribal Council formally petitioned for cancellation of the lease agreements, and in 1974 the Secretary of the Interior issued a decision suspending coal development on the Reservation. Ultimately, pursuant to legislation passed by Congress at the Tribe’s request, the leases were cancelled. Around the same time, the Tribe began to fear that individual Tribal members would attempt to lease allotted lands for coal development, and requested that Congress terminate the grant of mineral rights to allottees and reserve mineral rights on the Reservation “in perpetuity for the benefit of the Tribe.” Congress took action conditioned on a judicial determination that the allottees did not have vested rights to the mineral deposits under the 1926 Northern Cheyenne Allotment Act. In *Northern Cheyenne Tribe v. Hollowbreast*, 425 U.S. 649 (1976), the United States Supreme Court confirmed that the 1926 Act did not give allottees vested rights to the mineral deposits on the Reservation, and the Tribe formally regained control of the mineral rights underlying the Reservation. *The Northern Cheyenne Tribe and Its Reservation* at 2-26 to 2-28.

The Tribe has not developed its on-Reservation coal resources, and has resisted attempts to develop off-Reservation resources in the Tribe’s traditional homeland. In the 1970s, as a result of the plan to construct two 750 megawatt coal-fired generators approximately 20 miles north of the Reservation, in Colstrip, the Tribe became the first governmental entity to voluntarily classify its air shed as “Class 1” under the federal Clean Air Act, a designation that had previously been applied only to national parks and wilderness areas. In the 1980s, the Tribe successfully challenged a massive sale of federal coal in the Powder River region on the grounds that the sale breached the trust responsibility to the Tribe, violated federal coal leasing regulations, and violated NEPA. In 1996, the Tribe joined forces with other groups to successfully challenge the proposed extension of a mining permit for the proposed Montco mine. In 2006, the Tribe led successful litigation to protect water quality in the Tongue River from

impacts associated with coalbed methane operations. *The Northern Cheyenne Tribe and Its Reservation* at 2-28 to 2-30.

With this long history in mind, the Tribe prepared and submitted scoping comments to the STB in January 2013 on the Tongue River Railroad proposal, which the Tribe views as the latest encroachment on the lands and culture of the Northern Cheyenne people. The Tribe's scoping comments expressed concern that the project would have significant adverse effects on the human health of Tribal members, the Reservation environment, and the cultural and economic interests of the Tribe and its members. Northern Cheyenne Tribe's Scoping Letter at 1 (Jan. 2013) ("The Tribe is concerned that the Proposed Action may undermine its significant efforts to protect the environment and human health on the Reservation and minimize the impact of energy development on the Reservation Environment."). The Tribe called on the STB to pay "particular attention to any disproportionate effects that the Proposed Action may have on the Tribe, its members, and the Reservation environment." And the Tribe specifically asked the STB to fully evaluate the socioeconomic, aesthetic, cultural, and recreational impacts to the Tribe from the project. *Id.* at 3-5.

For the reasons detailed below, the DEIS falls far short of conducting the full evaluation necessary to address the concerns the Tribe expressed in its scoping letter or to give the Tribe confidence that construction and operation of the Tongue River Railroad will not have unacceptable and irreversible impacts on the way of life that the Northern Cheyenne people have fought to protect for centuries. The project must not be allowed to move forward until the potential impacts to Tribal interests have been fully evaluated and disclosed to the Tribe and the general public.

III. Legal Standards

Under NEPA, an EIS must provide a "full and fair discussion of significant environmental impacts and shall inform decision makers and the public of the reasonable alternatives which would avoid or minimize adverse impacts or enhance the quality of the human environment." 40 C.F.R. § 1502.1; *see also* 42 U.S.C. § 4332(C). This is necessary to ensure that a federal decision-maker has "detailed information on significant environmental impacts when it makes its decision" and "to guarantee that this information will be available to a larger audience." *Morongo Band of Mission Indians v. FAA*, 161 F.3d 569, 575 (9th Cir. 1998) (quoting *Inland Empire Pub. Lands Council v. United States Forest Serv.*, 88 F.3d 754, 758 (9th Cir. 1996)).

An EIS is a "procedural requirement[] designed to force agencies to take a 'hard look' at environmental consequences." *Alliance for the Wild Rockies v. United States Dep't of Agric.*, 772 F.3d 592, 606 (9th Cir. 2014) (quoting *Earth Island Inst. v. U.S. Forest Serv.*, 351 F.3d 1291, 1300 (9th Cir. 2003)) (brackets in original). This "hard look" must include a thorough analysis of "cumulative impacts" of a project, which are defined as "the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions" and can "result from individually minor but collectively significant actions taking place over a period of time." 40 C.F.R. § 1508.7; *see also*

Or. Natural Res. Council Fund v. Brong, 492 F.3d 1120, 1132-33 (9th Cir. 2007). “When an agency is evaluating reasonably foreseeable significant adverse effects on the human environment in an [EIS] and there is incomplete or unavailable information, the agency shall always make it clear that such information is lacking.” 40 C.F.R. § 1502.22.

In assessing the intensity of potential impacts from a proposed project, NEPA requires the STB to evaluate impacts that affect the “[u]nique characteristics of the geographic area such as proximity to historic or cultural resources” 40 C.F.R. § 1508.27(b)(3). In addition, the STB is to consider “[t]he degree to which the effects on the quality of the human environment are likely to be highly controversial” and “[t]he degree to which the action may . . . cause loss or destruction of significant scientific, cultural, or historical resources.” 40 C.F.R. §§ 1508.27(b)(4), (b)(8). NEPA’s requirements, coupled with the federal government’s trust relationship with the Tribe, make it critical that the STB fully evaluate the impacts to the Tribe and the Reservation that might result from the proposed action, including impacts that may disproportionately affect the Tribe or its members.

IV. Tribe’s Concerns

The Tribe believes that the STB has failed to satisfy its NEPA obligations and violated the trust responsibility because it has not taken a “hard look” at the potential impacts that the Project will have on the Tribe and its members, including the cumulative impacts from the TRRR and the coal mines in the region that may be induced if the STB licenses the TRRR.

a. Socioeconomics

The Northern Cheyenne population is underprivileged and has many socioeconomic challenges. With extremely limited resources, the Tribe struggles to provide basic services for its people. The proposed railroad and associated mines would exacerbate these conditions by compounding negative socioeconomic conditions in the Reservation without providing many counterbalancing benefits to the Tribe. For example, unlike the surrounding counties, the Tribe will receive zero tax or other revenue from the proposed projects. As a result, the proposed project will necessarily have disproportionately adverse socioeconomic effects on the Tribe and its members.

The Tribe expressed its concerns regarding socioeconomic impacts in the scoping letter it submitted on the TRRR proposal. Northern Cheyenne Scoping Letter at 5. Unfortunately, as detailed below and in the report of Dr. Thomas Power, Ph.D., attached as Appendix A, the DEIS fails to address the Tribe’s concerns. Accordingly, the Tribe calls upon STB to engage in a proper assessment of the potential socioeconomic impacts on the Tribe from the project, and evaluate available measures to mitigate those impacts.

In general, the STB’s conclusions in the DEIS regarding socioeconomic impacts are misleading because they substantially understate the potential impacts of the TRRR and the coal mines it is intended to bring into existence. The chapter and technical appendix labeled “socioeconomics” concludes that there will be only modest socioeconomic impacts associated

with the construction and operation of the TRRR. According to the STB, the economic changes “would not be sufficient to alter the current population and economic trends in the study area.” TRRR DEIS at 15-1. However, the socioeconomics chapter in the DEIS fails to account for the impacts of the new coal mines that may be induced by the TRRR. Depending on the level of production at the coal mines induced by the TRRR, the increase in the population of the area would be between about 2,000 and 7,000, thirty to one hundred times what the DEIS Socioeconomic chapter concludes would be the impact of the TRRR alone. Appendix A at ii, 10-11. While the STB acknowledges these broader socioeconomic impacts in the chapter of the DEIS addressing cumulative impacts, its analysis of the cumulative socioeconomic impacts is deeply flawed.

In particular, the STB made no attempt to identify any unique socioeconomic conditions of the Northern Cheyenne Reservation and its residents. In fact, the STB’s socioeconomic analysis rarely mentions the Northern Cheyenne Tribe. Instead, the analysis combines the Northern Cheyenne population with the overall population of a four or nine-county study area. In Rosebud and Bighorn County, nearly half of the population is Native American. Appendix A at 16. Yet, the DEIS fails to grapple with this unique population that will be affected by the railroad and associated mines.

Below are some of the unique socioeconomic characteristics on the Northern Cheyenne Reservation that the DEIS failed to consider:

- The Northern Cheyenne population is much younger when compared with surrounding areas. In Rosebud County, the median age on-Reservation is 23 and off-Reservation is 43. Appendix A at 19-20 and Figures 5 and 6.
- The Northern Cheyenne population is much more densely populated. *Id.* at 17-19. The non-Reservation areas have 1.3 persons per square mile, while the Northern Cheyenne Reservation has a population density of 6.8 persons per square mile. *Id.* at 17-18 and Figure 4.
- The Northern Cheyenne population is much poorer than the population in the surrounding counties. *Id.* at 21-22. There is a huge disparity in incomes in Rosebud County between the Indian and the non-Indian regions. On a per capita basis, in the predominantly white off-Reservation population in Rosebud County, people enjoy 109% higher income per person than their predominantly American Indian neighbors on the Reservation: \$12,559 on-Reservation versus \$26,271 off-Reservation. *Id.* at 21 and Table 1.
- The unemployment rate on the Reservation is almost 14 times that found off the Reservation in Rosebud County: 27% on-Reservation versus 2% off-Reservation. *Id.* at 23. This is despite the fact that the Northern Cheyenne is overall a well-educated group when compared to Rosebud County and the United States as a whole. The laudable educational attainment of the Tribe is not rewarded with high paying jobs. *Id.* at 25-27.

By ignoring these and other profound disparities between on- and off-Reservation populations, the DEIS effectively obscures the socioeconomic vulnerability of the Northern Cheyenne. As a result of these vulnerabilities, the likelihood that the Northern Cheyenne could be harmed by off-Reservation coal development and face barriers to sharing in the potential benefits of that coal development is increased substantially.

Instead of appropriate analysis and discussion of these conditions on the Reservation, the DEIS simply assumes that projected increases in employment, payroll, population, and local government tax revenues that result from the new coal development are convincing evidence that the project will provide significant socioeconomic benefits in the region. In doing so, the STB ignores the significant body of professional socioeconomic literature that has developed over the last half-century that provides a more sophisticated understanding of the impacts of energy booms and their unequal distribution of costs and benefits among residents. *See* Appendix A at i-ii, 2-6, and notes 6, 8-16. The STB's failure to use information from past experiences with energy development booms is all the more puzzling given the widespread discussion, both in the popular press and in professional studies, of the effects of the contemporary Bakken energy boom in western North Dakota and eastern Montana. *Id.* at 3-6. As this professional literature indicates, "a rising tide lifts all ships" is not an economic principle supported by the empirical analysis of past energy booms. Given the existence of a large vulnerable minority population adjacent to the proposed coal developments and the facilitating railroad, professionally sophisticated analysis of expected socioeconomic impacts is needed, which the DEIS fails to provide. *Id.* at ii-iii.

The STB's assumptions of positive socioeconomic impacts are particularly inappropriate in light of the data on the effects of the coal boom that occurred in same region in the 1972-1990 period. Specifically, during the 1970s and 1980s, a half-dozen new coal mines and four coal-fired electric generators were constructed in the region surrounding the Northern Cheyenne Reservation. The result was a massive increase in employment, payroll, and population in that region. Remarkably, during this major energy boom near the Reservation, the Tribe fell further behind its off-Reservation neighbors, and any prosperity accrual occurred off-Reservation. Between 1970 and 1990, the unemployment rate on the Reservation actually increased. Appendix A at 36. Real median family income on the Reservation declined from \$32,300 to \$28,900 in 1980 and, by 1990, declined further to \$26,800, an overall decline of almost one-sixth. *Id.* at 35. In 1970, before the energy boom, the Northern Cheyenne Reservation had a median family income that was 90 percent of that of Rosebud County as a whole. *Id.* By 1990, the Reservation median family income fell to only 45 percent of income in all of Rosebud County. *Id.* The poverty rate on the Reservation during this period also increased from 41 to 48 percent, while it declined in the off-Reservation portion of Rosebud County from 20 to 10 percent. *Id.* at 36. The percent of Reservation residents living below the poverty level rose from twice that of the Rosebud County residents living off the Reservation to almost five times that of non-Reservation residents. *Id.* Home ownership fell from about 80 percent to about 60 percent. *Id.* at 36-37 and Table 8. In sum, despite the energy boom in the region, fewer people within the Reservation households were working and the pay received by those who were working was

much lower than experienced by those living off the Reservation. *Id.* at 41. The reality of this economic situation is not mentioned in the DEIS.

The Northern Cheyenne Reservation business economy did not prosper from the energy boom either. The Reservation did not have a local economy that was able to derive the local economic benefits associated with the new dollars being generated. Rather than gain from the increased levels of income and expenditures, the Reservation declined in terms of its commercial rank within the regional economy. Appendix A at 44-45. Today, the Reservation economy is even less likely to benefit from energy development. There are fewer businesses on-Reservation now than there were during the energy boom, and residents do most of their shopping off-Reservation. *Id.* at 45. Again, the DEIS fails to consider these facts.

Overall, the socioeconomic analysis in the DEIS focuses almost exclusively on the general characteristics of the region while failing to account for the disparate socioeconomic conditions on the Northern Cheyenne Reservation, which make the Tribe's members more vulnerable to the adverse economic effects of the project while at the same time less able to realize socioeconomic benefits that may accrue in other communities. In order for the DEIS to have legitimacy, the STB must include a full evaluation of the current socioeconomic conditions on the Reservation, the socioeconomic impacts to the Tribal members and the Reservation that might result from the proposed action, and measures that may help to mitigate socioeconomic impacts to the Tribe.

b. Cultural Resources

In the Tribe's scoping letter, it expressed concern that the proposed project would impact sites of religious and cultural significance to the Tribe. Northern Cheyenne Scoping Letter at 4. The Tribe described numerous types of religious and culturally significant sites and explained that "[t]hese types of sites occur throughout the Tongue River Valley and may be impacted by construction activities and operations." *Id.*

The Tribe considers cultural resources to be an important way in which Tribal members maintain connection with their relatives and their past:

From the tribal-historical perspective, cultural resources are evidence that the landscape has always been physically and spiritually compatible with tribal peoples. The location of sites is interpreted as being evidence that sometime in the past, tribal peoples recognized the physical and spiritual characteristics of the landscape that made it an appropriate place to camp, hunt, fast and so on. Because traditional tribal peoples today can still recognize these same physical and spiritual characteristics of the landscape, there is a continuing tie between the people and the landscape, and between the people who created the site and those who view it today. It is this sense of connectedness that is important. Because the relationship is highly valued, sites must be shown respect and the tie to the sites may be periodically renewed by visiting them, praying and making offerings. These are significant qualities of site locations that transcend time. . . . The

presence of the sites/features indicates an earlier relationship with the landscape and validates the continuing relationship with the area into the present.

The Northern Cheyenne Tribe and Its Reservation at 7-3. Generally, it is not considered important which tribal group was responsible for creating a culturally significant site—whether created by Northern Cheyenne, Crow, Sioux, or another tribe, the sites are significant to Northern Cheyenne members because “they describe why the Indians who made the site might have camped or hunted in that particular location or why they might have chosen to build particular features.” *Id.* at 7-4.

As indicated in the Tribe’s scoping letter, culturally significant sites are not limited to the Reservation. Rather, “[t]he early Cheyenne Homesteads east of the Tongue River have ongoing significance to the Northern Cheyenne.” *The Northern Cheyenne Tribe and Its Reservation* at 7-21. These sites may be associated with establishment of the Reservation or with important individuals. *Id.* A list of homesteads on the Otter Creek, Hanging Woman Creek, and Tongue River drainages was provided with the Tribe’s scoping letter. *Id.* at G1 to G13.

In addition to homesteads, there are several other types of culturally significant sites that may occur in the project area. These include large cairns (2+ meters in diameter); pilgrimage and trail marker cairns; vision quest and fasting structures; eagle trapping pits; medicine wheels, arrows, alignments, and pair lines; and very large and very small rings. *The Northern Cheyenne Tribe and Its Reservation* at 7-7 (citations omitted). Graves are also of spiritual importance to the Tribe and should not be disturbed. *Id.* at 7-6. Traditional cultural properties may also include “springs, ceremonial sites, and places where special plants and animals are found.” *Id.* at 7-8.

The Tribe is very concerned that the STB did not accurately identify cultural resources that may be impacted in the project area. The report prepared by Chris Finley, a retired National Park Service archaeologist, which was submitted to the STB on May 28, 2015, is attached as Appendix B to this letter. The Finley report raises several troubling issues regarding the Tongue River Railroad Cultural Resource Survey that was conducted by ICF International on behalf of the STB. Most troubling to the Tribe is the identification of “36 undocumented sites . . . including 5 cairns, 7 lithic scatters, 2 lithic procurement sites, 1 rock shelter, 2 historic rock art sites, 2 stone circle sites, 6 probable prehistoric burials, 2 historic burials, 1 [traditional cultural property], 6 historic sites, and 4 isolates.” Appendix B at 18. In addition, Mr. Finley noted that additional undocumented sites and cultural materials would likely have been identified if not for the heavy vegetation cover in the area. *Id.* Mr. Finley also noted numerous flaws with the documentation collected by ICF for their survey. *Id.*

On August 6, 2015, Members of the Tribe’s Cultural Commission conducted a field visit to the areas investigated by Mr. Finley. Appendix C. As a result of this field visit, the Tribe was able to determine that Mr. Finley’s report was accurate and concurred in its findings. *Id.* The Cultural Commission was able to identify additional sites – sites not identified by either STB or Mr. Finley – within the proposed Colstrip Alternative alignment, including 14 burial sites, stone

circles, effigy sites, and cairns. *Id.* Undoubtedly, more sites would be identified if more time and resources were dedicated to finding them.

In light of the findings described above, the Tribe believes that the STB's assessment of potential impacts to cultural resources is inconsistent with the STB's obligations under NEPA and Section 106 of the National Historic Preservation Act. *See Te-Moak Tribe of W. Shoshone of Nev. v. United States DOI*, 608 F.3d 592, 607 (9th Cir. 2010); *Tongass Conservation Soc. v. Cheney*, 1989 U.S. Dist. LEXIS 13516, *37 (D.D.C. Nov. 9, 1989).³

c. Air Quality

The Tribe's scoping comments expressed significant concerns regarding potential air quality impacts from the proposed project:

The Tribe's considerable efforts to protect Reservation air quality and visibility would be further undermined if coal dust, diesel emissions, and other emissions from construction activities and operations associated with the Proposed Action are not adequately mitigated.

Northern Cheyenne Scoping Letter at 3. As extensively detailed in the attached report of Dr. Ranajit Sahu, Ph.D., the DEIS does not adequately address these concerns. Accordingly, the Tribe has little confidence that air quality on the Reservation will not be significantly and disproportionately impacted by the TRRR.

Of greatest concern to the Tribe is the apparent gross underestimation of potential coal dust emissions from the project. Data provided by BNSF indicate that coal dust emissions from the tops of rail cars are 600 pounds per car over a 400 mile route. Appendix D at 18. Based on these data, Dr. Sahu calculated that coal dust emissions for the Decker/high production scenario would be 46,687 tons per year, a result that is 277 times higher than the estimate provided by the STB (of 168.3 tons/year). *Id.* at 18. Even taking into account the STB's (unsupported) assumption that mitigation measures (load shaping and topper agents) reduce coal dust emissions by 85 percent, Dr. Sahu's estimate is still 41 times higher than the estimate provided by the STB. *Id.* at 18 n.36. Based on this analysis, Dr. Sahu concluded that the STB's estimates for coal dust emissions from the TRRR are "grossly inaccurate." *Id.* at 19.

The coal dust assessment in the DEIS is flawed in other respects as well. For example, the STB failed to acknowledge that coal dust is not only directly emitted from the rail cars themselves, but also can be re-entrained as the result of the passage of trains affecting trackside dust that has accumulated over time. Appendix D at 7-8. In addition, although coal from the Powder River Basin is "known to be highly friable" and "subject to breakage under many factors," *id.* at 16, the STB based its particle size distributions on coal from Australia and

³ In addition to the concerns raised above regarding cultural resources, the Tribe joins in the concerns raised in the Colstrip Alternative Landowners Group's comment letter on the TRRR DEIS relating to cultural resources (pages 13-14). The Tribe also adopts and incorporates by reference the discussion of impacts to cultural resources contained in the comment letter submitted by Earthjustice and other environmental groups (Section III).

provided no basis for assuming that the characteristics of Australia coal are relevant in assessing impacts from the TRRR. *Id.* at 16-17. Also, the STB did not provide “the specific assumed speed(s) used in the calculations for each build alternative/line” *Id.* at 19. Moreover, the DEIS uses averaging instead of the more commonly used maximum values to estimate trace element concentrations in coal dust and fails to disclose where the samples came from, how the samples were obtained, or how representative the samples were in relation to coal at the likely mine sites. *Id.* at 21. And the coal dust deposition modeling is “fatally compromised” because the smallest fraction size used is a particle of “less than 60 microns in diameter,” even though “particle sizes of concern include much smaller sizes such as PM10 and PM2.5” and these smaller particles “could travel much farther than the assumed 300 meters distance” *Id.* at 23-24.

Moreover, where the STB’s analysis indicates that there may be significant impacts from TRRR emissions, the STB inappropriately minimizes these findings without adequate support. For example, in assessing the impacts of nitrogen dioxide emissions, the DEIS provides that the “anticipated maximum 1-hour NO₂ concentrations would be expected to be less than the modeled levels.” TRRR DEIS at 4-17 to 4-18. The STB made a similar assertion with respect to barium concentrations in surface waters resulting from coal dust deposition. TRRR DEIS at 9.2-13; *see also* TRRR DEIS at 6.1 to 6.2. As explained in Dr. Sahu’s attached report:

These are misleading characterizations and should be struck from the Draft EIS. If the STB/OEA believes that its analysis overestimates a predicted impact, it should provide specifics of how and why this overestimate occurred rather than vague and unquantified references to overestimation and bias.

The STB should then correct or not include such overestimate. Or, the STB should provide its analysis of what it believes the “actual” (as opposed to the overpredicted) impact will be. But, in reality, no one – not even the STB – can provide an analysis of the “actual” future impact. That is why analyses rely on predictions. And, predictions can include, with good reason, conservative assumptions. That is not because the goal is to inflate a future impact – it is simply a prudent practice in order to accommodate the many unknowns inherent in a predictive analysis that can result in underestimating impacts.

Appendix D at 9-10. In addition, it does not appear that the STB considered whether certain non-conservative assumptions might counterbalance any conservative assumptions that went into the modeling. For example, as discussed above, it appears that the STB’s assumed emissions profile for coal dust grossly underestimates the amount of dust emitted from the project, which would result in higher barium concentrations than those modeled. *See id.* at 18. In addition, with respect to NO₂ concentrations and AERMOD, the STB failed to “discussion underestimation of the rates used” but rather “assume[d] 100% compliance with standards, which is not a conservative assumption.” *Id.* at 10-11.

The STB also provided inadequate information to assess the efficacy of coal dust mitigation measures. In particular, “much is unknown as far as the composition of almost all of

the ‘approved’ [topper] agents.” Appendix D at 21-22. The Tribe submitted a Freedom of Information Act request to the STB seeking additional information regarding the efficacy of coal dust mitigation measures; however, the STB has agreed to disclose only 2 of the 96 potentially responsive documents identified, and even the 2 disclosed documents are “subject to redactions under FOIA Exemption 5.” Appendix I at 1. As detailed in the response letter attached as Appendix J, the Tribe questions the validity of the STB’s asserted bases for withholding the requested documents, which the Tribe believes must be publicly disclosed in order to give the public a better understanding of the potential impacts related to coal dust emissions from the project.

Finally, the DEIS omits any analysis of specific air quality impacts to the Tribe. Rather, the STB’s analysis is focused on a larger “project area,” and implicitly assumes that air quality impacts throughout this project area are of equal importance. Appendix B at 6-7. There is no attempt to assess whether Tribal resources, including the Tribe’s Class 1 airshed, will be disproportionately affected by the project. *Id.*⁴

d. Surface Water Quality

The eastern Reservation boundary is the mid-point of the Tongue River, and the Tribe is concerned that its ability to maintain and enhance water quality in the Tongue River and its tributaries will be impacted by the proposed project. These concerns were expressed in the Tribe’s scoping letter:

The Tribe is also concerned with the potential impacts that the Proposed Action will have on ground and surface water quality within the Reservation. . . . Water quality on portions of the Tongue River, which forms the eastern boundary of the Reservation, and its tributaries, is already impaired, largely as a result of agricultural runoff, discharges from municipal point sources, and discharges from coalbed methane operations.

Northern Cheyenne Scoping Letter at 3-4.

The Tribe has taken an active role in the protection of water quality in the Tongue River and other Tribal waters. In 2006, EPA approved the Tribe’s request for “treatment as state” (“TAS”) authority to administer water quality standards and water quality certification programs on Reservation waters, including the Tongue River. In 2013, the Northern Cheyenne Tribe updated its water quality standards, attached as Appendix E, which were adopted to “enhance the quality of water and serve the purposes of the Federal Clean Water Act.” Appendix E at § 1.1.1. While the DEIS acknowledges that the Tribe has adopted water quality standards and an anti-degradation policy, TRRR DEIS at 9.2-9, there is no evidence that the STB considered whether

⁴ In addition, the Tribe concurs with the discussion submitted by Earthjustice and other environmental groups explaining that the TRRR DEIS does not adequately assess the cumulative impacts to the global climate resulting from the proposed project. Accordingly, the Tribe adopts and incorporates by reference Section II of the comment letter Earthjustice *et al.* submitted to the STB on September 23, 2015.

any discharges from the proposed TRRR or induced projects such as the Otter Creek Mine would cause violations of the Tribe's water quality standards or the Tribe's anti-degradation policy.

Pursuant to 40 C.F.R. § 131.10, the Tribe's water quality standards designate specific uses and values for Reservation waters. Appendix E at B1-B43. For example, the Tongue River (from Cook Creek to the Birney Day Bridge, and from the Birney Day Bridge to Logging Creek) has been assigned the following use designations and values (*see id.* at B19):

Class I Cool Water Propagation – Provides for protection, propagation, and growth of cool water fishes, as well as protection, growth, and propagation of associated aquatic life normally found in waters where the summer temperatures do not often exceed 25 degrees C.

Full Contact Recreation – These surface waters are suitable or intended to become suitable for recreational activities in or on the water when the ingestion of small quantities of water is likely to occur. Such waters include but are not limited to those used for bathing, swimming, and ceremonial uses.

Public Water Supply – These surface waters are suitable or intended to become suitable for drinking, culinary and food processing purposes, after conventional treatment for naturally present impurities.

Wildlife – These surface waters are suitable for all furbearers and waterfowl.

Agriculture – These surface waters are suitable or intended to become suitable for crops usually grown on the reservation and are not hazardous as drinking water for livestock.

Industrial – These are waters suitable for industrial processes and cooling water.

Cultural – These waters are suitable for cultural, ceremonial, and religious uses to support and maintain the way of life and traditional activities practiced on the Northern Cheyenne Reservation. These activities include, but are not limited to cultural, spiritual and medicinal practices which include the preservation and utilization of riparian habitat, as well as associated wetland species, significant to the cultural values of the Northern Cheyenne Tribe. These practices may include full contact and incidental contact with surface waters.

Wetlands – These surface waters are suitable for maintaining and restoring natural wetland characteristics and functions, within the natural range of variation of the wetland.

Id. at § 1.3.4. These use designations are enforceable as narrative water quality standards. *Id.* at § 1.3.5(A) (“Reservation surface waters must be free from substances which are or may become injurious to public health, safety, welfare, or any of the designated or existing beneficial uses.”).

Other enforceable narrative standards require that Reservation surface waters be kept free from the substances that:

- (1) Settle to form objectionable sludge deposits or emulsions beneath the surface of the water or upon adjoining shorelines;
- (2) Create floating debris, scum, a visible oil film (or oil be present in concentrations at or in excess of 10 milligrams per liter) or globules of grease or other floating materials;
- (3) Produce odors, colors or other conditions which create a nuisance or render undesirable tastes to fish flesh or make fish inedible;
- (4) Create concentrations or combinations of materials which are toxic or harmful to human, animal, plant or aquatic life except for pesticide application as described in this section below; and
- (5) Create conditions which produce undesirable aquatic life.

Id. at § 1.3.5(A). In addition, the Tribe has numeric water quality standards for numerous pollutants commonly found in coal dust including lead, mercury, arsenic, and barium. *Id.* at A1-A13.

The STB has failed to evaluate the direct, indirect, or cumulative effects of the proposed project on the Tribe's ability to maintain and achieve its narrative and numeric water standards in the Tongue River and other Reservation surface waters potentially impacted by the project. In addition, the DEIS does not assess whether the proposed project will violate the Tribe's anti-degradation policy, which generally provides that "[e]xisting instream water uses and the level of water quality to protect the existing uses shall be maintained and protected." *Id.* at § 1.4.1(1). The STB's failure to fully evaluate the proposed project's consistency with the Tribe's water quality standards and anti-degradation policy is inconsistent with its NEPA obligations and its trust relationship with the Tribe. *See, e.g.*, 40 C.F.R. § 1502.16(c) (assessment of environmental consequences "shall include discussions of . . . [p]ossible conflicts between the proposed actions and the objectives of Federal, regional, State, and local (and in the case of a reservation, Indian tribe) land use plans, policies and controls for the area concerned").

Particularly worrisome is the STB's failures to assess impacts to drinking water sources relied upon by Tribal members. The Tongue River (downstream of the project area) is the source for drinking water at the local St. Labre Indian School. Each year, hundreds of young Tribal members drink from that source, as well as many other people associated with the school. As noted above, the Tribe's water quality standards require that the Tongue River water be suitable as a public drinking water supply. The DEIS fails to recognize the existing use of the Tongue River for drinking water at the St. Labre Indian School and assess whether this use will be impacted by the project.

In addition, the Tribe believes that the DEIS inappropriately downplays the potential impacts of particular pollutants on water quality. For example, the STB's water quality analysis indicates that levels of barium in surface waters would exceed screening levels, but the STB minimizes this finding on the basis that it made "conservative assumptions" in analyzing barium

concentrations that “overestimate the amount of barium that might reach the water, and do not consider the likelihood that barium would quickly precipitate out of solution. . . .” TRRR DEIS at 9.2-13; *see also* TRRR DEIS at 6.1 to 6.2.⁵ Similarly, the DEIS states that “conservative assumptions used to model suspended solids concentrations that could result from coal dust deposition overestimate the likely concentration of coal dust suspended in water, which would be small relative to existing levels of suspended solids in the Tongue River.” TRRR DEIS at 6-21; *see also* TRRR DEIS at 9.2-9. The STB should fully document the “conservative assumptions” it believes result in an overestimation of barium and total suspended solids (“TSS”) concentrations and, to the extent possible, provide quantitative data on how these assumptions affect the estimates of pollutant concentrations. *See* Appendix D at 10] (“If the [STB] believes that its analysis overestimates a predicted impact, it should provide specifics of how [and] why this overestimate occurred rather than vague and unquantified references to overestimation and bias.”).

Also, with respect to TSS, the Tribe is greatly concerned that the cumulative effects of the proposed project would result in TSS discharges into waterbodies listed as impaired for TSS by the State of Montana, or would result in violations of the Tribe’s narrative water quality standards. *See* 40 C.F.R. § 122.4(a) (providing that “[n]o permit may be issued” “[w]hen the conditions of the permit do not provide for compliance with the applicable requirements of CWA, or regulations promulgated under CWA); *see also* 33 U.S.C. § 1311(b)(1)(C); 40 C.F.R. § 122.44(d)(1); *Friends of Pinto Creek v. EPA*, 504 F.3d 1007, 1012 (9th Cir. 2007); 54 Fed. Reg. 23868, 23879 (June 2, 1989); *In the Matter of Las Virgenes Municipal Water Dist.*, State of Cal. State Water Res. Control Bd. Order No. WQ 98-11 at 11 (Nov. 19, 1998).

The Tribe is also greatly concerned by the STB’s conclusion that “[s]tormwater discharges from the railbed and access roads could convey low concentrations of [PAHs and heavy metals] to surface waters” and that “[a]ny release of PAHs and heavy metals associated with operating the proposed rail line could degrade surface water quality in the immediate vicinity of the rail line.” TRRR DEIS at 9.2-18. The STB must evaluate the permitting and certification requirements for any stormwater discharges to Tribal waters such as the Tongue River. CWA permitting on the Northern Cheyenne Reservation is administered by EPA, and any such permitting must be conditioned to ensure that the discharges do not violate water quality standards and are certified by the Tribe pursuant to section 401 of the Clean Water Act.

In addition, as the STB acknowledges, there is recent caselaw indicating that coal dust deposited into waterways from coal trains must be permitted under the Clean Water Act. TRRR DEIS at 6-25. Indeed, two district courts in Washington State have separately rejected arguments that coal dust discharged into navigable waterways from coal trains cannot be regulated as a “point source” under the Clean Water Act. *Sierra Club v. BNSF Ry. Co.*, 2014 U.S. Dist. LEXIS 1035, *14 (E.D. Wash. 2014); *Sierra Club v. BNSF Ry. Co.*, No. 2:13-cv-00967 (W.D. Wash. 2013). In light of these decisions, the STB should proceed under the assumption that discharge permits will be required for coal dust emissions from the TRRR coal

⁵ The Tribe notes that the STB appears to have significantly underestimated coal dust emissions, *see supra* Section IV.c, and thus also likely significantly underestimated the concentrations of barium in surface waters. *See* Appendix D at 9-10.

trains, and that such permits would also need to be conditioned and certified to ensure that the Tribe's water quality standards in the Tongue River are not violated.⁶

e. Wetlands and Hydraulic Conditions

As mentioned in the materials submitted with the Tribe's scoping letter, wetlands in the project area are of special cultural significance to the Tribe because many plants used for traditional and cultural purposes are found in wetland areas. *The Northern Cheyenne Tribe and Its Reservation*, at 6-61. Plants of cultural significance in wetlands and the surrounding riparian and/or upland areas in the project area may include boxelder, western yarrow, common spikerush, green ash, field mint, wild bergamot, plains cottonwood, chokecherry, curly dock, sandbar willow, big sagebrush, silver sage, showy milkweed, breadroot, American licorice, junegrass, joeye-weed, sweetgrass, and Nevada bulrush. *See* Appendix F at 12, 14 [Geum Report]; *see also The Northern Cheyenne Tribe and Its Reservation* at 6-62.

Some of these culturally significant plants, such as joeye-weed and sweetgrass, are not common in the area near the Northern Cheyenne Reservation, and thus impacts to wetlands containing these plants may reduce the Tribe's access to these species. *See* Appendix F at 14. Joeye-weed is used to treat fevers and backaches. *The Northern Cheyenne Tribe and Its Reservation*, at F-6. Sweetgrass has ceremonial uses for purification, medicinal uses, and is also used for perfume and hair wash. *Id.* at F-8.

Unfortunately, the methodology the STB used in its wetlands assessment—the Department of Transportation's Montana Wetland Assessment Method (MWAM)—does not require documentation of which plant species were encountered during the STB's wetlands surveys, and thus provides no basis to assess the extent of the potential impacts to culturally significant plant species. Appendix F at 12. The STB should assess whether impacts to wetlands in the project area will impair the ability of Northern Cheyenne members to access culturally significant plant species, including the species on the list the Tribe submitted with its scoping comments. *See The Northern Cheyenne Tribe and Its Reservation*, at F-1 to F-13.

The STB's use of MWAM for its wetlands assessment is also inappropriate because MWAM is not well suited to assess wetlands in the project area in eastern Montana. For example, the representative composite wetland assessments for broad wetland types used in the MWAM miss characteristics of some wetland types such as depressional wetlands. Appendix F at 8-9. In addition, the MWAM is influenced by the presence of special status species (ESA listed and candidate species and species of concern) and their associated habitats, but such species are less common in eastern Montana and their primary habitat is not extensively documented in this portion of the state. *Id.* at 10-11. Also, the MWAM category rankings are influenced by the "uniqueness" of wetlands, but the types of unique wetlands referenced in the MWAM are rare or do not occur in eastern Montana. *Id.* at 11-12.

⁶ The Tribe also believes that the STB failed to adequately analyze the indirect and cumulative impacts of the proposed project on surface water and groundwater resources. The Tribe accordingly adopts and incorporates by reference the discussion of impacts to surface water and groundwater contained in the comment letter Earthjustice and other environmental groups submitted to the STB on the TRRR DEIS (Section V).

As a result of these characteristics of the MWAM, wetlands in eastern Montana will receive lower rankings than wetlands in western Montana, even when such wetlands are equivalent in terms of structure and function. This effect is illustrated in Table 8 of the Geum Report (Appendix F at 8), where one of the surveyed wetlands (McRae_2) received a ranking as a Category III wetland using the MWAM, but using a methodology better suited for wetlands assessments in eastern Montana (the Montana Natural Heritage Program Ecological Integrity Assessment or MTNHP EIA), the same wetland received the highest ranking of the three wetlands assessed in the attached report. The Tribe is concerned that the STB's wetlands assessment systemically underestimates the importance of wetlands that will be affected by the proposed project, and calls on the STB to reassess potentially impacted wetlands using methodology more appropriate for conditions in eastern Montana, such as the MTNHP EIA method.

In addition, the Tribe believes that the DEIS did not adequately assess the potential risks to wetland integrity or develop the appropriate mitigation measures to address such risks. For example, soil disturbance associated with construction of the TRRR and associated facilities will create conditions ideal for the establishment of non-native noxious weeds, and these invasions have the potential to extend beyond the project right-of-way into nearby wetland and riparian areas and impact culturally significant species. Appendix F at 12-13. Also, because construction of the TRRR will take place over a relatively short period of time, disturbances relating to construction will likely result in more homogeneous wetlands than what would have developed over the course of a natural disturbance cycle. *Id.* at 13. To adequately address these risks, the Tribe calls on the STB to require, prior to commencement of construction, (1) a rigorous noxious and nuisance species management program, and (2) a program for the active management of plant species composition.

The Tribe is concerned about other impacts to hydraulic resources as well. In the DEIS, the STB acknowledged that there would be “unavoidable impacts on floodplains” including “decreased floodplain storage capacity, diversion of flood flows by fill placement, construction of flood flows at bridge and culvert locations, decreased floodplain water retention, and altered flood dynamic from the presence of rail infrastructure.” TRRR DEIS at 9.4-18. However, the STB concluded these impacts would be “minor,” in part because the STB “assumed the entire right-of-way would be disturbed during rail construction” but “[i]t is unlikely that the entire right-of-way would actually be disturbed” and “[t]herefore OEA’s assumption . . . likely overestimated the actual floodplain impacts.” TRRR DEIS at 9.4-1 to 9.4-2. While it may be true that all floodplains within the right-of-way will not be disturbed, the impacts to floodplains will not be limited to the right-of-way. As explained in Appendix F:

Permanent structures such as earthen dikes, or other structures associated with rail lines, have the potential to disconnect floodplains from the river or stream. This can significantly alter the hydrology of the floodplain with the likely impact of drying sections of the floodplain and potentially impacting cottonwood forests and other riparian vegetation communities on those floodplains. This alteration can also affect downstream flooding by decreasing flood attenuation on the floodplains. Potential effects from

increased flooding include increased bank migration rates on private land and damage to infrastructure.

Appendix F at 13. In light of this, the Tribe calls on the STB to conduct further analysis of potential impacts to floodplains outside of the TRRR right-of-way.

The Tribe is also concerned that the TRRR will adversely impact flows in intermittent and ephemeral streams. The aerial imagery provided with the DEIS indicates that the TRRR will bisect many such streams—for example, the Colstrip Alternative will bisect 10 ephemeral or intermittent drainages that flow into Greenleaf Creek, a tributary of Rosebud Creek. *Id.* at 13. The DEIS does not provide data quantifying flow inputs from these drainages to Otter Creek, Rosebud Creek, or the Tongue River. The DEIS also indicates that culverts and bridges will be used for some drainages, but fails to specify which drainages will have culverts and bridges. The Tribe believes that the potential impacts to intermittent and ephemeral streams cannot be reasonably assessed without flow data and disclosure of criteria for placement of culverts and bridges. This information is necessary for an adequate understanding of how the TRRR will impact these intermittent and ephemeral streams and the larger streams and rivers to which they flow.

The TRRR may also adversely impact springs and seeps. Indeed, along the proposed Colstrip and Colstrip East Alternatives, there are two springs documented by USGS, and one of the wetlands assessed in Appendix F (the McRae_02 site) includes an unnamed spring as well. Appendix F at 13-14]. Natural springs have cultural significance to Northern Cheyenne members. *The Northern Cheyenne Tribe and Its Reservation* at 7-11 (“Springs are the homes of spirits. Offerings are commonly left at springs today.”). Indeed, a survey conducted in 2001 indicated that “over 97% of the [Northern Cheyenne] people believe that springs have spiritual value.” *Id.* at 7-12. Unfortunately, the DEIS contains little analysis of the potential impacts to such springs and seeps.

Finally, the DEIS indicates that the Colstrip Alternatives would cross Rosebud Creek, requiring a new culvert or bridge over the existing channel. *See* TRRR DEIS at 9.2-22. The Tribe notes that Rosebud Creek has historically migrated across its floodplain, and that this migration is a natural process that rejuvenates the riparian zone and associated wetlands by creating areas of exposed sediment where native plant species can establish. Appendix F at 14. The Tribe is concerned that placing a new culvert or bridge over the channel would limit future migration of the channel, causing adverse impacts:

Potential consequences of limiting channel migration include, but are not limited to, stream incision or downcutting, increases in stream velocity from stream channelization (i.e., straightening of stream), and reduction in energy and processes such as overbank flooding that transfer nutrients to the floodplain and support regeneration of riparian vegetation.

Id. The DEIS does not adequately assess these impacts to Rosebud Creek and the adjacent floodplain.

Overall, the DEIS does not adequately assess impacts to wetlands and other hydraulic features. The STB failed to document the occurrence of culturally significant plant species in the wetlands it assessed, and the methodology the STB used to characterize wetlands in the project area is not well suited for use in eastern Montana. The STB failed to evaluate the risks to wetlands that could result from invasion of noxious weeds and loss of species diversity. It also failed to adequately evaluate the impacts to floodplains, the channel migration of Rosebud creek, and the impacts to springs and seeps in the project area, which are culturally important to the Tribe.

f. Biological Resources

In addition to the culturally important plant species found in wetlands, *see supra* Section IV.e, there are many other biological resources in and near the project area that are culturally important to the Tribe. As detailed in the Tribe's scoping letter, the Tribe is concerned that the project will have significant impacts on these resources:

The Proposed Action may . . . impact the Tribe's wildlife resources, which are culturally and economically important to the Tribe. Construction and operation . . . could disturb a wide variety of wildlife and their longstanding migration patterns on and near the Reservation

Northern Cheyenne Scoping Letter at 4.

While the Tribe considers the manner in which members make cultural use of biological resources to be a private matter, it has nonetheless provided some general details on the cultural uses of biological resources to demonstrate the importance of these species to Tribal members. The Tribe believes it is critical for the STB to fully evaluate whether the TRRR will have any direct, indirect, or cumulative impacts of biological resources that are important to Tribal members for cultural and/or subsistence purposes.

As discussed in the materials submitted with the Tribe's scoping comments, animals are an integral part of Cheyenne cosmology. *The Northern Cheyenne Tribe and Its Reservation* at 7-10 to 7-17. For example, many Cheyenne believe that "the Great Birds (eagles, hawks, dragonflies, and butterflies) . . . mediate between man and the sacred forces of the Blue-Sky Space . . ." *Id.* at 7-10. In addition, Cheyenne believe that "badgers and bears are important as symbols of the Deep Earth" and "buffaloes live in great caves under the surface and they present themselves to be killed whenever *Maheo* [the Creator] wants to bless the Cheyenne." *Id.* at 7-11. Northern Cheyenne traditional societies continue to exist today that are named after animals, as are many Tribal members. In 2001, 76 percent of surveyed members reported using parts of animals for ceremonial or social purposes. *The Northern Cheyenne Tribe and Its Reservation* at 7-15.

Tribal members rely on virtually all larger mammals found in the project area for ceremonial purposes. Mammals of cultural significance include the gray wolf, badger, mountain

lion, kit fox, red fox, American mink, mule deer, white-tailed deer, black-footed ferret, porcupine, and raccoon. The type of cultural use varies depending on species. For example, Tribal members use hooves from mule deer and white-tailed deer for dancing regalia and also to make traditional medicine. Pipes used during the Sun Dance are made from the lower leg bone of the antelope, and the lining of the deer esophagus and mule deer tails are necessary for the last day of the Sun Dance. *The Northern Cheyenne Tribe and Its Reservation* at 7-14. The American bison/buffalo is “a pivotal symbol of the Cheyenne ethnic identity as Indians” and Northern Cheyenne members make use of buffalo skulls, hides, and tails in ceremonies. *Id.* at 7-15.

The Tribe has been working for years to support the recovery of the endangered black-footed ferret, which depends almost exclusively on black-tailed prairie dogs for food and shelter. *See id.* at 6-52. Unfortunately, prairie dog populations and habitat in the region has been significantly reduced due to the sylvatic plague. *Id.*; *see also* TRRR DEIS, Appendix L, at 3-7. Noting this reduction in prairie dog populations, the STB determined that the black-footed ferret “is not known to occur in the action area” and that the impact to this endangered species would be “discountable.” TRRR DEIS, Appendix L, at 5-4. In reaching these conclusions, it does not appear that the STB evaluated whether the project area *historically* provided habitat for the black-tailed prairie dog and the black-footed ferret, or whether the project will prevent or diminish the future reestablishment of prairie dogs and ferrets in the project area.

Birds in the project area are also culturally significant to the Northern Cheyenne. Birds of cultural importance include raptors, doves, sandhill crane, chickadee, finches, night hawks, meadowlark, jays, crows, magpie, kingfisher, pigeons, sandpiper, swallow, American robin, mountain bluebird, kingbird, great blue heron, flicker, and woodpecker. As examples of cultural use, Tribal members use eagle feathers in their ceremonial rounds and other sacred ceremonies, eagle claws for dancing, eagle bones for whistles, and eagle wings and feathers in war bonnets. Owls are also culturally significant—many Tribal members consider owls to be an omen of taboo and maintain a high level of respect for the owl. Prairie falcons and red-tailed hawks are sources of medicine that Northern Cheyenne people use to treat cancer. *The Northern Cheyenne Tribe and Its Reservation*, at 7-15.

Certain reptile species are also culturally important. Tribal members make cultural use of short horned lizards, painted turtles, and rattlesnakes. Turtles, for example, are regularly associated with ceremonies, and “some sweat lodges are patterned after the turtle and its longevity.” *The Northern Cheyenne Tribe and Its Reservation*, at 7-12. Lizards are associated with the Sun Dance and dancers often wear lizard paint. *Id.* at 7-7.

Plants are also culturally significant to Tribal members. *See generally The Northern Cheyenne Tribe and Its Reservation* at 7-12 to 7-14 & Appendix F. Northern Cheyenne members traditionally regard plants as “living things with spirits,” Cheyenne children are taught to respect plants, and Cheyenne members sometimes develop life-long relationships with plants. *Id.* at 7-12. There are 170 plant species with documented cultural uses, and there are a minimum of 81 documented ceremonial uses for these plants, 184 medicinal uses, 67 industrial uses, and 94 subsistence uses. *Id.* at 7-13 to 7-14; *see also id.* at Appendix F. For example, juniper is used by Northern Cheyenne members to make flutes and charms with spiritual qualities and in ritual

purification of females as they become adults. *Id.* at 7-13. The Northern Cheyenne people continue to use plants for medicinal purposes as well—they use goldenrod as a general medicine; hairy golden aster as a relaxant and general tonic; alumroot to treat diarrhea and other ailments; surfspea to treat fever; juniper to manage respiratory and reproductive problems; purpose cone flower leaves and roots to treat mouth sores, aches and arthritis, and other illnesses; rabbitbrush to treat colds, coughs, and other illnesses; sage to treat sinus problems, nosebleeds, and headaches, and wild onion to treat carbuncles. *Id.* at 7-14.

In addition to cultural and medicinal uses discussed above, many Tribal members rely on biological resources in and near the project area for subsistence. Subsistence is both a way of life and an important part of the Tribal economy, and the basic food needs of the Northern Cheyenne's community are met, in part, by subsistence practices. Land animals important for subsistence include elk, mule deer, white tailed-deer, cottontail rabbit, jack rabbit, marmot, squirrel, weasel, sage grouse, wild turkey, pheasant, and meadowlark. The Tongue River provides prime habitat for elk and deer that are hunted by Tribal members. *The Northern Cheyenne Tribe and Its Reservation*, at 6-46. Dry meat—most commonly deer and elk meat—is still important to the Cheyenne diet, and the sharing of meat is a social obligation honored by 67 percent of Northern Cheyenne members surveyed in 2001. *Id.* at 7-15. Game such as elk and deer regularly cross the Tongue River. In addition, Tribal members have long relied on the harvest of the American bison/buffalo for subsistence, *id.* at 7-15, and the Tribe maintains a buffalo farm in close proximity to the project area.

The Tongue River also provides Tribal members with access to waterfowl and fish species. Most subsistence fishing occurs along the western bank of the Tongue River, for numerous fish species including smallmouth bass, walleye, sauger, northern pike, channel catfish, and the only population of rock bass in Montana. *Id.* at 6-53 to 6-54. In 2001, 60 percent of Northern Cheyenne members who were surveyed reported engaging in fishing. *Id.* at 7-16.

The Tribe is concerned that the TRRR will severely impact the cultural and subsistence uses of biological resources discussed above. In particular, the Tribe is concerned that the project will cause changes to fish and game behavior and availability, impact culturally important plant life, and have other aesthetic and noise impacts that will prevent or interfere with the traditional fishing, hunting, and gathering practices of Tribal members in the project area. Indeed, the DEIS acknowledges that project construction “could alter the local distribution of wildlife, which could affect the experience of users engaging in recreational hunting or wildlife viewing” and operation of the project “may affect wildlife movement patterns” and may cause game animals to “avoid some areas where they are currently found.” TRRR DEIS at 12.3-15 to 12.3-16. In light of the cultural importance of subsistence practices to Tribal members, and the Tribe's long connection to the Tongue River area, the STB should fully analyze such impacts.⁷

⁷ The Tribe believes that the STB's analysis of impacts to wildlife in the TRRR DEIS is deficient in other respects, including the failure to adequately evaluate the indirect and cumulative impacts on wildlife from the proposed project, and the failure to comply with Section 7 the Endangered Species Act. The Tribe accordingly adopts and incorporates by reference the discussion of impacts to wildlife contained in the comment letter Earthjustice and other environmental groups submitted to the STB on the TRRR DEIS (Section IV).

g. Catastrophic Risks

Under NEPA, the STB must evaluate all “reasonably foreseeable” effects of the proposed action. 40 C.F.R. § 1508.8(b). This includes an assessment of “impacts which have catastrophic consequences, even if their probably of occurrence is low, provided that the analysis of the impacts is supported by credible scientific evidence, is not based on pure conjecture, and is within the rule of reason.” 40 C.F.R. § 1502.22(b); *see also Tongass Conservation Soc. v. Cheney*, 1989 U.S. Dist. LEXIS 13516, *20-21 (D.D.C. Nov. 9, 1989).

It is reasonably foreseeable that the proposed TRRR may cause catastrophic environmental impacts. For example, the DEIS indicates that a train derailment could occur in the project area. TRRR DEIS at 3.2-7 to 3.2-8. While the DEIS claims that the risk of a major derailment is low and that the impacts would be minor, *id.*, the Tribe is concerned that should a major derailment occur, it would result in large quantities of coal being discharged into the Tongue River or a tributary, a wetland area adjacent to the project right-of-way, or another environmentally sensitive area. Such an event could destroy entire ecosystems, eliminate or limit access to culturally important plant and wildlife species, and cause major violations of water quality standards. *See* Appendix D at 10.

The DEIS also recognizes that construction and operation of the TRRR could cause wildfires on the lands adjacent to the right-of-way. TRRR DEIS at 8.2-13, 8.2-15 to 8.2-16. The Tribe is concerned that a large wildfire would have devastating and disproportionate impacts on the Tribe. *See* Northern Cheyenne Scoping Letter at 5. These impacts could include loss of income (because the Tribe generates revenue from timber sales), lost access to culturally significant plant and animal species, dramatic declines in air quality and visibility on the Northern Cheyenne Reservation, human health impacts to Reservation communities associated with degraded air quality, and severe aesthetic impacts to the traditionally significant homeland of the Tribe.

The Tribe notes that fire risk is not limited to the east side of the Tongue River. Rather, it is possible that a large scale fire triggered by the operation of the TRRR could cross the river and spread across lands within the Northern Cheyenne Reservation. As the result of past forest management strategies, lands on the Reservation are highly vulnerable to fires:

The forest [on the Northern Cheyenne Reservation] is dominated by ponderosa pine mixed with grasslands in a very arid environment, and wildfires naturally occur throughout the non-winter months. Past management strategies have focused on suppressing all wildland fires while providing no other means of reducing fuel loads. As a consequence of this, a series of destructive wildfires since 1980 have reduced the forested area of the reservation by approximately 50% and the *remaining forested acres show an abundance of acres with critically high loads of fuel for future wildfires*. This natural volatility, combined with an ongoing drought and increased use of the forest by a growing reservation population, makes the threat of further losses in forested areas to be a primary concern and focus for land management efforts.

Appendix G at 4 (emphasis added); *see also* TRRR DEIS at 8.2-17. The DEIS does not adequately assess how a large fire on or near the Northern Cheyenne Reservation would impact air quality, human health, the Tribe's economy, culturally significant plants and animals, or the aesthetics of the area.

In sum, the DEIS is flawed because it does not thoroughly address the potential impacts of catastrophic events such as a major derailment or large forest fire. The Tribe believes that there is "credible scientific information" regarding such impacts that the STB could use in its assessment. *See* 40 C.F.R. § 1502.22(b). For example, information regarding the amount of the coal to be transported on the TRRR, coupled with information regarding the proximity of the project area to the Tongue River and its tributaries and knowledge about the impacts of coal discharges into surface waters would constitute "credible scientific information" on which the STB could assess the impacts of a major derailment. Likewise, information regarding the fuel contents and fire potential of the lands adjacent to the project area or on the Reservation, coupled with data on the effects of widespread fires in the region, would give the STB a reasonable basis to assess the economic and environmental impacts of a large fire triggered by construction or operation of the TRRR.

h. Environmental Justice

In the Tribe's scoping letter, the Tribe called on the STB to conduct a complete and thorough review of the potential environmental justice implications from the proposed project:

The Tribe is concerned that the Proposed Action could have significant disproportionate impacts to the Tribe and its members, and urges STB to thoroughly evaluate and mitigate such impacts. Disproportionate adverse impacts are likely because Otter Creek is located only three miles from the eastern boundary of the Reservation, the proposed railroad would run along the eastern boundary of the Reservation parallel to the Tongue River and other important waterbodies, and existing conditions on the Reservation may make Tribal members more susceptible to impacts from the Proposed Action.

Northern Cheyenne Scoping Letter at 3; *see also id.* at 4 ("The Tribe is . . . concerned that the Proposed Action may result in disproportionate adverse health effects to Tribal members."). The Tribe expressed concern regarding the "[e]nvironmental justice implications of the Proposed Action, including the inequality of allowing the Tribe to suffer disproportionate impacts while receiving only limited benefits from the Proposed Action" and called on the STB to "conduct a thorough review of all direct, indirect, and cumulative impacts . . . with special focus on [any] disproportionate impacts to the Tribe and its members . . ." *Id.* at 5.

Despite these requests, the DEIS contains only a cursory environmental justice analysis. The STB limited its environmental justice analysis on the erroneous belief that it need only assess environmental justice relating to noise impacts because it "determined that only noise impacts could be considered high and adverse." TRRR DEIS at 16-3. In coming to this conclusion, it appears that the STB failed to consider important factors that should be included in an environmental justice analysis under Executive Order 12898 and the Council for

Environmental Quality (“CEQ”) guidance on implementing Executive Order 12898 in the NEPA context. Appendix H.

Contrary to the STB’s conclusion, there are numerous potential impacts from the project that could be considered “disproportionately high and adverse” to tribal interests. As detailed above, these include the potential impacts to air quality, water quality, wetlands, hydraulic conditions, socioeconomic conditions, and biological resources. For example, the Tribe believes that the disruption or diminishment of the ability of Tribal members to engage in cultural and traditional subsistence practices near the project area is a disproportionately high and adverse effect on the Tribe. The Tribe is also concerned that water quality impacts to the Tongue River, including bioaccumulation of contaminants such as barium and PAHs, *see supra* Section IV.d, will pose disproportionately high and adverse health risks to subsistence fisherman and deter traditional fishing practices in the Tongue River. In addition, the Tribe believes that the project will diminish the rural character of the project area and have negative aesthetic impacts, further deterring Tribal members from engaging in their traditional cultural and subsistence practices. The Tribe calls on the STB to evaluate whether any of the potential environmental impacts described in this letter would disproportionately impact the Tribe and to propose mitigation measures to eliminate such disproportionate impacts to the extent possible.

In conducting this analysis, Executive Order 12898 requires the STB to “whenever practicable and appropriate . . . collect, maintain, and analyze information on the consumption patterns of populations who principally rely on fish and/or wildlife for subsistence.” *Id.* at 32 (E.O. 12898, § 4-401). The CEQ Guidance elaborates that “[w]here an agency action may affect fish, vegetation, or wildlife, that agency action may also affect subsistence patterns of consumption and indicate the potential for disproportionately high and adverse human health or environmental effects on low-income populations, minority populations, and Indian tribes.” *Id.* at 3-4. Instead of following this guidance, the STB relied on EPA fish consumption screening values that “assume a daily consumption of 54 grams of fish and do not take into account populations such as subsistence fishers, which would require a site-specific evaluation.” TRRR DEIS, App. G, at G-21. In adopting these screening values, the STB failed to assess whether Tribal members who rely on subsistence fishing near the project area would be exposed to “disproportionately high and adverse” effects from the project. This failure is particularly troubling in light of the fact that the Tribe’s scoping letter included information regarding the importance of traditional subsistence practices, including hunting and fishing, to Tribal members. *See The Northern Cheyenne Tribe and Its Reservation* at 6-46, 7-9 to 7-16. The STB should have made effort to ascertain whether a higher subsistence consumption rate by Tribal members might result in disproportionately high and adverse effects.

The STB’s environmental justice assessment should also evaluate “relevant public health data and industry data concerning the potential for multiple or cumulative exposure to human health or environmental hazards” and “historical patterns of exposure to environmental hazards” on the Reservation. *See* Appendix H at 9. There is no evidence in the DEIS that the STB considered public health data of residents of the Northern Cheyenne Reservation or historical exposures on the Reservation in determining that the project would not cause “disproportionately high and adverse effects” on the Tribe’s members. Information regarding the public health

conditions on the Northern Cheyenne Reservation was provided with the Tribe's scoping comments. *The Northern Cheyenne Tribe and Its Reservation* at 3-39 to 3-51.

Finally, an environmental justice analysis should not look at environmental impacts in isolation, but rather should “recognize the interrelated cultural, social, occupational, historical, or economic factors that may amplify the natural and physical environmental effects of the proposed agency action.” Appendix H at 9. These amplifying factors include the socioeconomic situation on the Reservation (detailed *supra* Section IV.a). Indeed, numerous factors on the Reservation may amplify the impacts of the project on the Tribe, including widespread poverty and reduced access to medical care and emergency services. Given that the Tribe has no opportunity to receive tax revenue from the project, any such impacts would be greater on the Tribe than others. There is no evidence in the DEIS that the STB evaluated whether these amplifying factors would result in “disproportionately high and adverse” effects on the Tribe and its members from the proposed action.

In sum, the Tribe is concerned that the proposed action may significantly and disproportionately impact the health, welfare, and traditional way of life of the Northern Cheyenne people. The Tribe calls on the STB to conduct a rigorous environmental justice analysis of the proposed project that includes assessment of potential disproportionate health impacts to Tribal members who rely on subsistence fishing or hunting, the manner in which the proposed project will disproportionately disrupt or interfere with traditional tribal subsistence and cultural practices, whether Tribal members will suffer disproportionate impacts relating to air and water quality, whether historical and cumulative conditions on the Northern Cheyenne Reservation may exacerbate human health risks to Tribal members or environmental impacts on the Reservation, and whether the socioeconomic conditions on the Reservation will cause the amplification of health, environmental, or cultural impacts.

i. Other Concerns

The Tribe has numerous other concerns relating to the STB's assessment of the TRRR proposal. For example, the Tribe questions whether there is public demand or need for the project, since the STB's own analysis indicates that coal transported on the TRRR might “primarily displace other Power River Basin coal destined for markets in the Upper Midwest,” that “traffic on downline routes would not change considerably,” and that “the same amount of rail traffic would flow from the Powder River Basin to the Pacific Northwest if coal export capacity is expanded, with or without the proposed rail line.” TRRR DEIS at S-9; *see also id.* at 5.2-14 (“All exported Tongue River coal would displace other Powder River coal that otherwise would have been exported rather than incrementally adding to the total tonnage of coal exported.”).

In addition, the Tribe is troubled that the STB has not disclosed its preferred alternative for the project. *See* 40 C.F.R. § 1502.14(e). Identification of a preferred alternative would have allowed the public to focus their comments on the project impacts most likely to occur, and may have reduced the amount of resources expended by the Tribe and other parties in developing comments on the DEIS.

The Tribe has concerns regarding the mitigation measures discussed in the DEIS. For example, it appears that many of the mitigation measures discussed in the DEIS will not be enforceable as permit conditions, giving the Tribe little confidence that such measures will be implemented. In addition, the Tribe questions the STB's reliance on "voluntary" mitigation measures that amount to the applicant complying with applicable laws. *See, e.g.*, TRRR DEIS at 19-3 (voluntary mitigation measures to mitigate transportation impacts); *id.* at 19-21 (voluntary mitigation measure for cultural resource impacts).

V. Conclusion

As detailed above, in reviewing the DEIS for the Tongue River Railroad, the Tribe has identified numerous flaws and omissions, and has come to the conclusion that the STB failed to take the requisite "hard look" at the potential environmental, cultural, and socioeconomic impacts of the project, as required by NEPA. As a federal agency with fiduciary obligations to the Tribe, the STB must do a better job at assessing whether the proposed project will harm the Tribe's environment and the traditional way-of-life that the Northern Cheyenne people have fought to maintain for centuries.

The Tribe calls on the STB to prepare a new DEIS for the TRRR that fully addresses the concerns raised in this letter. In doing so, the STB should closely coordinate with the Tribe's technical staff and attorneys. Please contact William Walksalong, Tribal Administrator, at (406) 477-6284, for assistance in identifying the appropriate Tribal contacts.

Sincerely,



Llevando Fisher

President, Northern Cheyenne Tribe

Cc (by email only):

Darryl LaCounte, Regional Director, U.S. Bureau of Indian Affairs,
darryl.lacounte@bia.gov.

Michael Addy, Superintendent, U.S. Bureau of Indian Affairs, Northern Cheyenne
Agency, michael.addy@bia.gov.

Shaun McGrath, Regional Administrator, U.S. Environmental Protection Agency,
r8eisc@epa.gov.

Noreen Walsh, Regional Director, U.S. Fish and Wildlife Service,
Noreen_Walsh@fws.gov.

Appendices

- Appendix A: *Comment on the Socio-Economic Impacts of the Tongue River Railroad and Associated Coal Mines and its Treatment in the Draft Environmental Impact Statement*, Power Consulting Inc. (Sept. 2015).
- Appendix B: *Cultural Resources Survey Assessment of Colstrip Alternative Route for the Proposed Tongue River Railroad*, Chris Finley (May 2015).
- Appendix C: *Cultural Commission Field Visit*, Northern Cheyenne Tribe (Aug. 2015).
- Appendix D: *Comments on the Air Quality (Chapter 4) and Coal Dust (Chapter 6) Sections of the Draft EIS for the Proposed Tongue River Railroad Company, Inc. Rain Construction and Operation in Custer, Powder River and Rosebud Counties, Docket No. 30186, Surface Transportation Board (STB), Office of Environmental Analysis (OEA)*, Dr. Ranajit Sahu (Sept. 2015).
- Appendix E: Northern Cheyenne Tribe's Water Quality Standards (updated Mar. 2013).
- Appendix F: *Tongue River Draft Environmental Impact Statement Wetland and Water Resources Comments*, Geum Environmental Consulting, Inc. (Aug. 2015).
- Appendix G: Forest Management Plan for the Northern Cheyenne Reservation (2009).
- Appendix H: *Environmental Justice: Guidance under the National Environmental Policy Act*, Council on Environmental Quality (Dec. 1997).
- Appendix I: Letter from Marilyn Levitt to Joshua Osborne-Klein re FOIA (Sept. 10, 2015).
- Appendix J: Letter from Joshua Osborne-Klein to Marilyn Levitt re FOIA (Sept. 15, 2015).
- Appendix K: Northern Cheyenne Tribal Council Resolution (Sept. 21, 2015).
- Appendix L: Dr. K. Norman Johnson, *Saving the Forests of the Northern Cheyenne Reservation* (Jan. 25, 2012).

Saving the Forests of the Northern Cheyenne Reservation

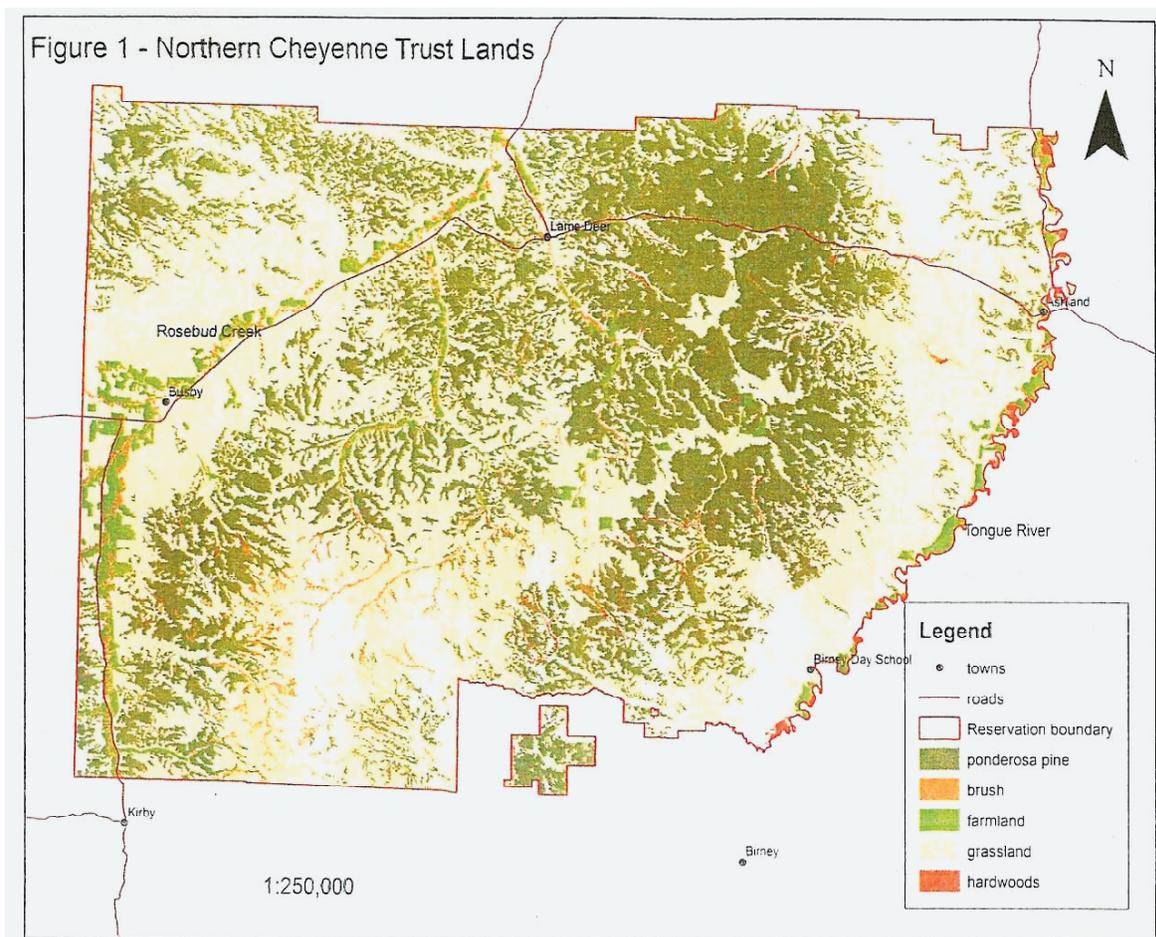
Dr. K. Norman Johnson, Oregon State University
with the assistance of Chris Dunn, Fire and Fuels Expert, Oregon State University

Background

I visited the Northern Cheyenne Reservation for two days in early December, 2011. My purpose was to evaluate potential claims of mismanagement of Reservation lands by the Bureau of Indian Affairs (BIA). On that visit, I went out on the Reservation forest with Terry Spang, Tribal Forest Director. In addition, I reviewed a number of Tribal and BIA documents on forest inventory and forest management, met with members of the Tribal Council, and met with a number of Tribal environmental professionals. This report summarizes my findings.

Resources

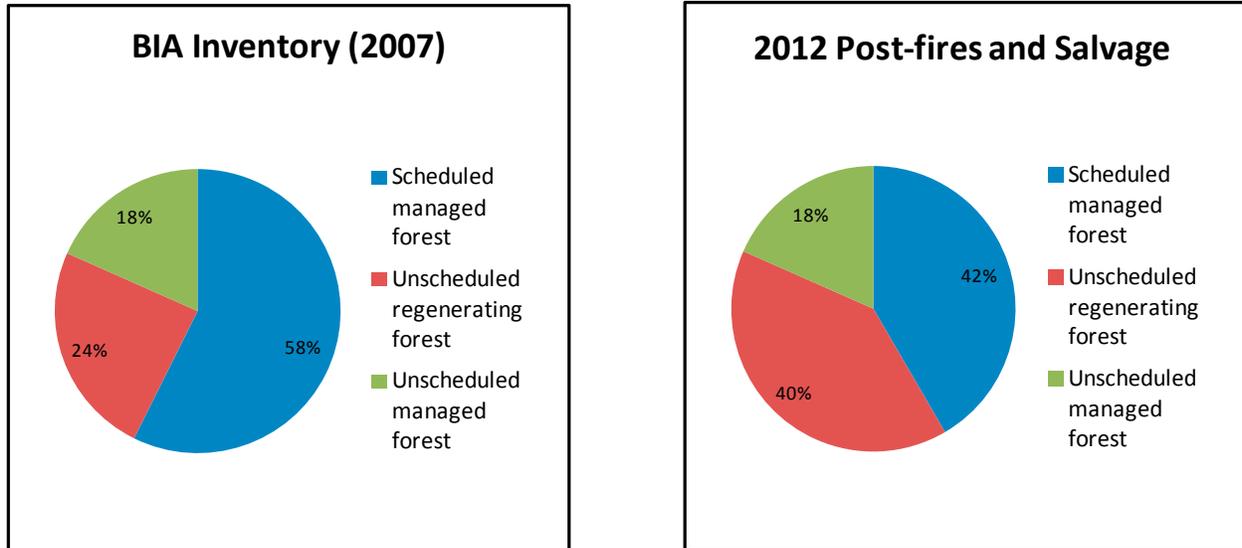
The total area of forestland on the Northern Cheyenne Reservation equals approximately 155,000 acres (Figure 1). “Woodlands” in creek bottoms, especially aspen and poplar stands, cover approximately two percent of the area. These very important stands are discussed elsewhere in our reports.



Source: BIA 2007

Ponderosa pine covers almost all of the 152,500 of conifer forest on the Reservation. In 2007, the BIA divided this forest into three classes based on recent history and whether sufficient commercial volume exists for a commercial timber sale (BIA 2007) (Figure 2).

Figure 2. Allocation of Reservation Forests.



The scheduled managed forest is that portion of the forest that passes an economic test for a timber harvest. Most of that forest is scheduled in the 2009 Forest Management Plan for removal of its merchantable inventory over 15 years. The unscheduled regenerating forest covers areas recently burned that now contain mostly seedling and saplings. The unscheduled managed forest includes lands judged too steep or unstable to log and also pole-sized stands from past disturbances. As the seedling and sapling stands grow, most will be added back into the scheduled managed forest. Similarly many of the pole stands may eventually added in the scheduled forest.

Fires that have occurred since the 2007 inventory was taken, especially those of 2011, have further reduced the scheduled managed (merchantable) forest, shifting those acres into the unscheduled regeneration forest (Figure 2).

Problem Analysis

The forests of the Northern Cheyenne Reservation are in a dire, unsustainable condition as a result of past management strategies. Much of the forest has been lost to wildfire in the last few decades (Figures 3-5).

As stated by the BIA (2007), “The events of the last two decades have had major consequences. During this period, the forest was hit by a series of devastating wildfires that completely destroyed many of the best stands of timber.” More fires have occurred since then. Without action, many of the remaining forested lands will likely be destroyed by fire in the next few decades.

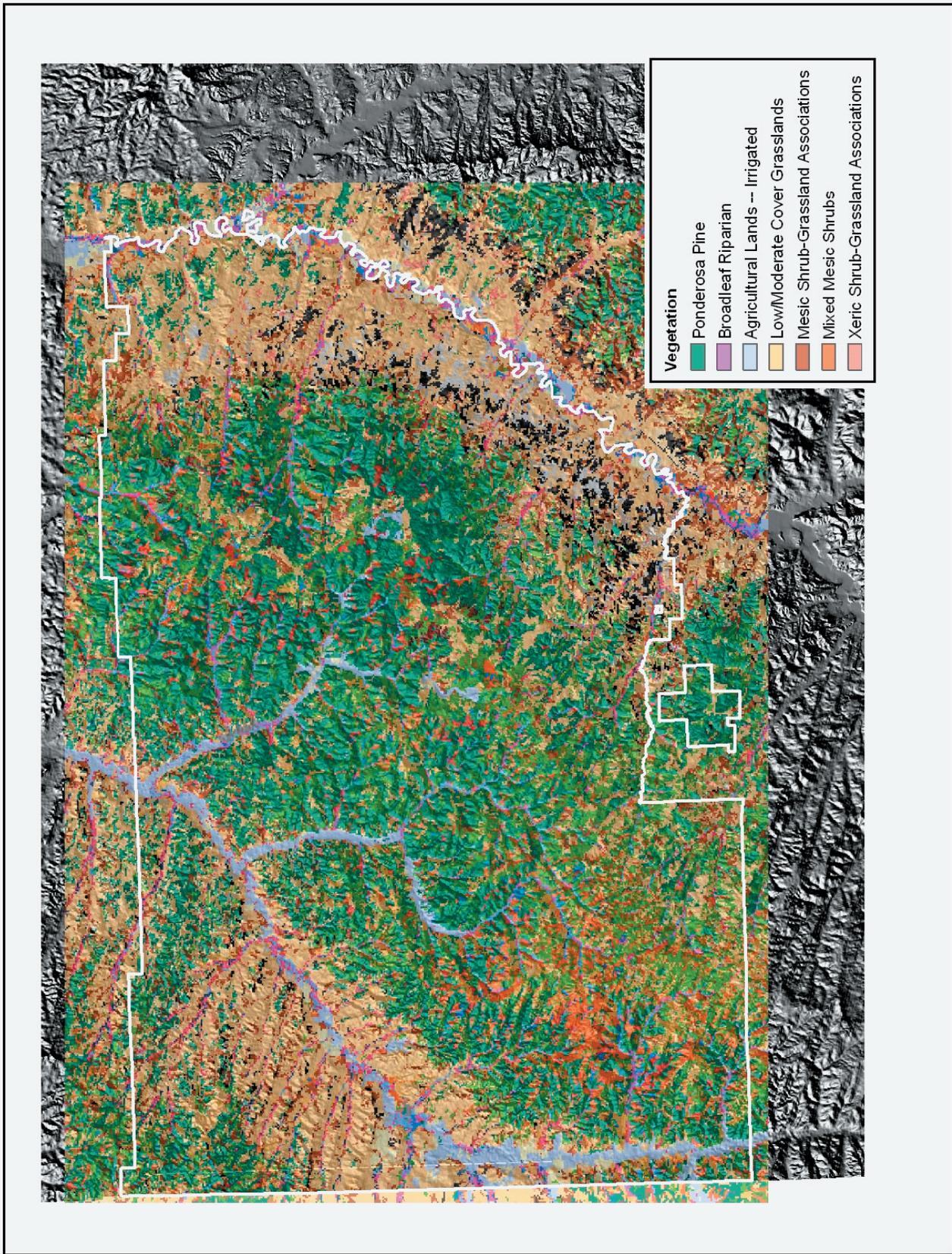


Figure 3. Vegetation types on the Northern Cheyenne Reservation

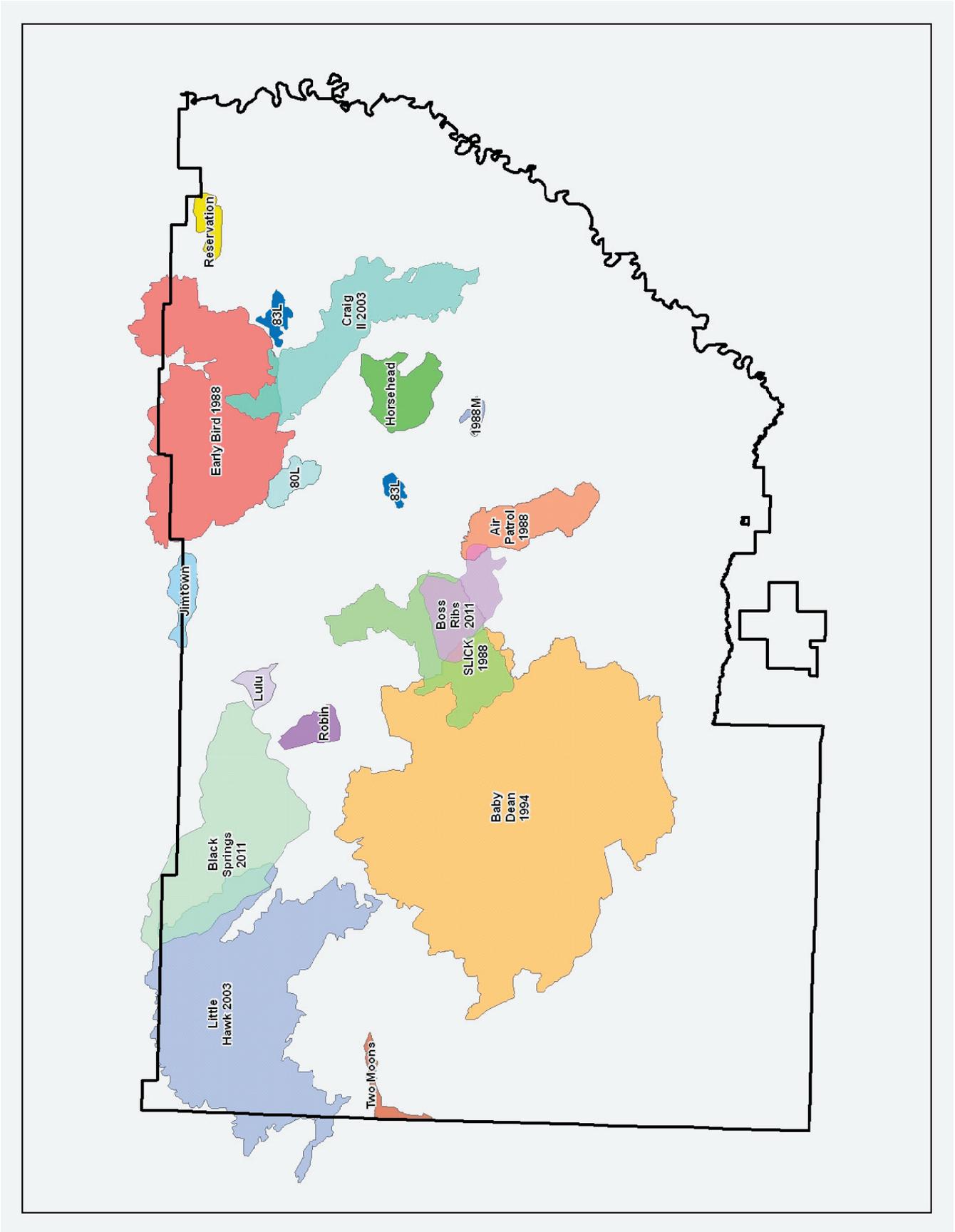


Figure 4. Historical fires on the Northern Cheyenne Reservation.

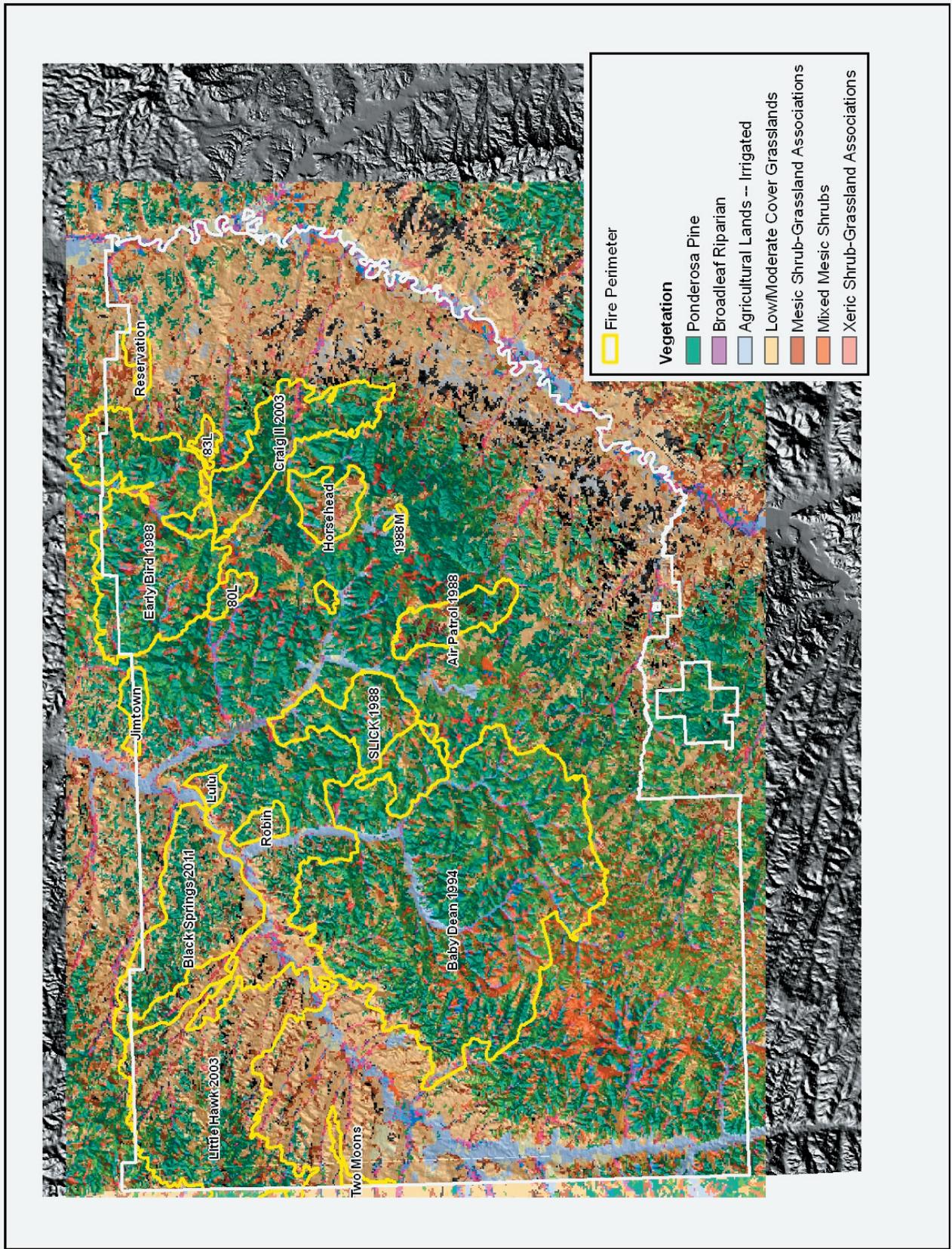


Figure 5. Historical fires have been predominantly associated with conifer forest lands.

The magnitude of this problem is acknowledged in the last two forest management plans developed by the BIA. The 1999 Forest Management Plan states (Northern Cheyenne Tribe and BIA 1999, page 29):

“Because of prolonged fire exclusion and past logging practices that favored overstory removal, dense, multi-storied stands with stagnating lower stories are now commonplace. Many of the once open, old-growth stands have now become overcrowded with younger trees, forming a dense lower story, which survived in the absence of fire. The current forest structure not only increases the wildfire hazard, but has also created a forest health problem.

In the semiarid environment of eastern Montana, pine forests are highly vulnerable to drought, insect attacks, and severe wildfire when overstocked with trees. With increasing competition, mainly for water, the growth rate declines as trees stagnate and their crowns recede. Forest production also drops off in dense stands. As tree cover has increased, light dependent bunch grass and shrub communities have gradually disappeared.

The typical multi-storied stand is now comprised of a light overstory consisting of scattered 200 to 300 year old yellow pine intermingled with a dense stand of tightly spaced 60 to 80 year old trees.”

The 2009 Forest Management Plan draws similar conclusions about the current condition of the forests of the Northern Cheyenne Reservation (BIA 2009, page 4, italics added):

“A significant challenge to forest management on the Northern Cheyenne Reservation has been how to improve the forest by making it more resistant to fire. The forest is dominated by ponderosa pine mixed with grasslands in a very arid environment, and wildfires naturally occur throughout the non-winter months. Past management strategies have focused on suppressing all wildland fires while providing no other means of reducing fuel loads. As a consequence of this, a series of destructive wildfires since 1980 have reduced the forested area of the reservation by approximately 50% and the remaining forested acres show an abundance of acres with critically high loads of fuel for future wildfires. This natural volatility, combined with an ongoing drought and increased use of the forest by a growing reservation population, makes the threat of further losses in forested areas to be a primary concern and focus for land management efforts.”

Since those words were written, more massive fires have swept over the Northern Cheyenne Reservation: in 2011, lowering the acres of unburned forest that might be managed for wood products in the next 15 years from 87,000 to approximately 64,000 (Figure 2).

On my visit, I saw both the effect of recent fires (photos) and the critical condition of the remaining forest (photos). Historically wildfires were a common occurrence on the Reservation from lightning strikes. Those historical fires were generally “low-severity fires” spreading along the ground and occasionally flaring up to torch a tree or clump of trees. These fires helped shape the classic unevenaged forests of the Reservation--large trees in clumps or well-spaced with patches of reproduction scattered over the landscape. Because of the harvest of large overstory trees and the exclusion of fire, spatially contiguous dense stands of small and medium-sized ponderosa pine now dominate the landscape. This forest condition increases fire hazard by increasing vertical fuel continuity (ladder fuels) that facilitate the transfer of surface fires to tree crowns. Once fire reaches the forest canopy, continuous dense crowns promote active crown fires which are high-severity fires that kill most trees. In addition, the dense stands sur-

round the remaining mature and old trees, creating competitive stress that will result in insect outbreaks during drought.

The Likely Future: Cycles of high-severity fire followed by salvage logging until most of the remaining forests of the Northern Cheyenne are destroyed.

The impacts of recent fires have been difficult on the Northern Cheyenne people but the loss of the remaining forests would be devastating. The 2009 forest management plan included a survey of Tribal interests and values that drew 363 responses from Tribal members. Over 70% of Tribal members (who responded to the survey) spend one week or more using forested areas for recreation, hunting, or cultural/spiritual reasons and 40% used the forest for one month or more annually. Water quality protection was judged more important than commercial timber harvest and a majority thought that timber sales should be designed to promote big game habitat even if this results in less revenue from timber harvest.

In sum, without comprehensive, immediate action to reduce stand densities, the recent destructive pattern will be repeated (i.e. fires, salvage, fires, salvage) until the historical forests of the Northern Cheyenne are gone. These forests will then be replaced by even-aged ponderosa pine plantations decades away from being commercially harvestable and contributing positively to the economy and culture of the Northern Cheyenne people.

Potential Strategies for the Forests of the Northern Cheyenne Reservation

The BIA's 2009 forest management plan calls for harvest of almost all commercial-sized trees in the unburned forest to create income and employment for the Tribe. The plan proposes that this economic harvest will be augmented by precommercial thinning and fuel reduction through mechanical means and prescribed fire as funds are available.

One approach might be to change the specifications of commercial sales to include fuel hazard reduction as a component of the sale or to direct some of the "10% monies" (deductions from stumpage) toward that effort. Some efficiency could certainly be gained through combining the two efforts. However, little of the commercial harvest proposed by the BIA in its 2009 plan is occurring. Commercial harvest of the green forest has collapsed due to a lack of markets for ponderosa pine sawtimber. Since 2004, harvest (outside of fire salvage) has averaged less than one million board feet out of an allowable cut of almost seven million board feet per year. Only 2004 and 2005 saw significant commercial harvest but were a result of salvage after large fires.

As stated in the recent Forest Management Plan (BIA 2009, p. 21): "The 10 year period from 1999 to 2008 saw a steady decline in the value of timber and a reduction in the number of sawmills in the interior west. During the same period, sawmills closed throughout the region or curtailed production. The Tongue River Lumber Company sawmill in Ashland, Montana owned by the Northern Cheyenne Tribe closed late in 2000. Cody Lumber of Cody, Wyoming closed in 2006 and Wyoming Sawmills in Sheridan, Wyoming closed at the end of 2008." "...the sawmill operated by Neimann Enterprises in Hulett, Wyoming was the closest sawmill to the reservation in 2009 at a distance of 154 miles. This sawmill has stringent requirements for delivered logs, accepting no logs less than 12 inches in diameter." Further the 2009 plan states (p. 62): "This [haul distance] combined with increasing fuel prices and the absence of a rail connection to the reservation area makes the cost of hauling logs to the mill excessive, often resulting in a negative value appraisal for the standing timber... This will be a factor in marketing timber from the reservation when the economic recovery occurs in that stumpage prices paid will likely remain depressed."

Finally, the 2009 Forest Management Plan acknowledges (p. 63): “The Northern Cheyenne Tribe has historically derived considerable revenue from the sale of forest products, with some estimates indicating half or more of the Tribes’ annual budget coming from stumpage paid on timber sales...Current revenue streams from timber sales are minor and seemingly insignificant when compared with those of a decade ago.”

Implication: Green timber sales, the heart of the 2009 Forest Plan, cannot be counted on to produce revenue to help with fuel reduction work in the near future, either directly as part of timber sales or indirectly through forest management deductions. Substantial harvest and income has been produced only from salvage after fires in which most or all of the fire-killed forest is removed.

In addition, if implemented, the commercial harvests in the 2009 BIA Forest Management Plan could make the situation worse: “This alternative would result in the harvest of 103.5 mmbf of timber during the next 15 years, and all 87,452 acres of scheduled, managed forest land would be treated during the planning period. Silvicultural treatments would only leave a residual volume of approximately 12% of the merchantable timber currently available”(BIA 2009, p 27). Thus, the plan would 1) complete the removal of the historical overstory old-growth pine trees which are the defining characteristic of these forests, and 2) remove almost all remaining commercial value, leaving thickets of small, submerchantable trees. While growth of these little trees could, in theory, provide valuable timber decades from now, it is more probable that they will burn. Precommercial thinning can be designed to help here, but it occurs at relatively low rates and the source of the funds (forest development funds) does not allow for dealing with the slash, thus creating a short-term fuel hazard problem.

Proposed strategy: Utilize hazardous fuel reduction, along with precommercial thinning, to reduce fuel accumulations and stand densities to mitigate high-severity fire

Substantial action focused on reducing stand densities, as called for in BIA plans, would significantly reduce the threat of catastrophic fire and loss of these forests. However, those actions require significant investment. At current implementation rates, though, these efforts will not prevent the catastrophic loss of the Northern Cheyenne Reservation forests.

Fuel reduction treatments can be an effective strategy for reducing fire hazard. Two common approaches are taken for reducing hazardous fuels. First, underburning or broadcast burning (prescribed fire, Rx burn) can be applied in a forested stand when weather conditions permit. Returning fire to the landscape in this fashion is a strategy that can effectively mitigate high-severity fire and is often the end goal of hazardous fuels reduction programs. Where appropriate, the application of prescribed fire should be encouraged, but in most fire-adapted forest systems of the western United States, this is not initially feasible.

Applying prescribed fire in dense stands like those on the Northern Cheyenne Reservation, without mechanical treatment first, is inherently risky, not recommended, and not generally used across the West as the initial treatment in dense stands of ponderosa pine. The significant accumulation of surface fuels and continuous vertical canopy structure facilitate the transfer of fire from the surface to the crowns of co-dominant and dominant overstory trees. This vertical fuel structure makes the forests of the Northern Cheyenne Reservation highly susceptible to individual or group tree torching, and potentially active crown fire, during prescribed fire operations. Additionally, the increased competitive stress on larger trees makes them more susceptible to mortality by root or cambial damage than trees growing under more open conditions. Prescribed burning can occur when weather conditions are conducive to low fire behavior and minimal fire effects but with little benefit. The goal of density and/or fuels re-

duction will likely not be met under these conditions because minimal fire intensity is required to prevent escape or damage to residual trees. The windows of opportunity that meet required weather and fuel conditions often do not occur; if prescribed burning is still conducted it can result in high tree mortality or escaped fires with catastrophic consequences. Such concerns recently led the Tribal Council to request that the BIA cease its prescribed fire program for fuel hazard reduction.

A more common approach to reducing fuels in these types of forests begins by mechanical treatments focused on thinning small and midsized trees to create a much more open forest. Leave trees are spatially arranged to reduce crown continuity which reduces active crown fire potential and increases fire suppression opportunities. As stated before, the thinning operation creates a great deal of slash which must be dealt with or the heat released when combusted will result in high tree mortality. As stated on the BIA’s website regarding hazardous fuels reduction, “Mechanical treatments are most often used in areas where fire has been excluded from for long periods of time, or around communities where prescribed fire or smoke management may have unintended consequences. A mechanical treatment can include thinning, regeneration cuts, pruning, mastication, chipping. Products from these activities often produce biomass.” (DOI-BIA website 2012).

Additional treatments generally entail piling and burning of the biomass within 1-2 years of the mechanical treatment. Piles are burned during wet periods (winter, spring and fall) when risk of escape is minimized by snow and/or wet fuels. Significant investment into hazardous fuels reduction has occurred on DOI and USDA Forest Service lands across the western United States following the development of the National Fire Plan of 2000. Much of this work continues today and most agencies pursue mechanical treatment, followed by biomass piling and pile burning. For example, between 2003 and 2011 a total of 465,053 acres of public and Tribal lands in Montana were treated with mechanical treatment (Figure 6). Almost all mechanically treated acres require follow-up treatments that include pile and burning. Pile burning is recorded as prescribed fire accomplishments and account for the majority of acres burned. This is the most common and necessary strategy to deal with reducing hazardous fuels in forested environments.

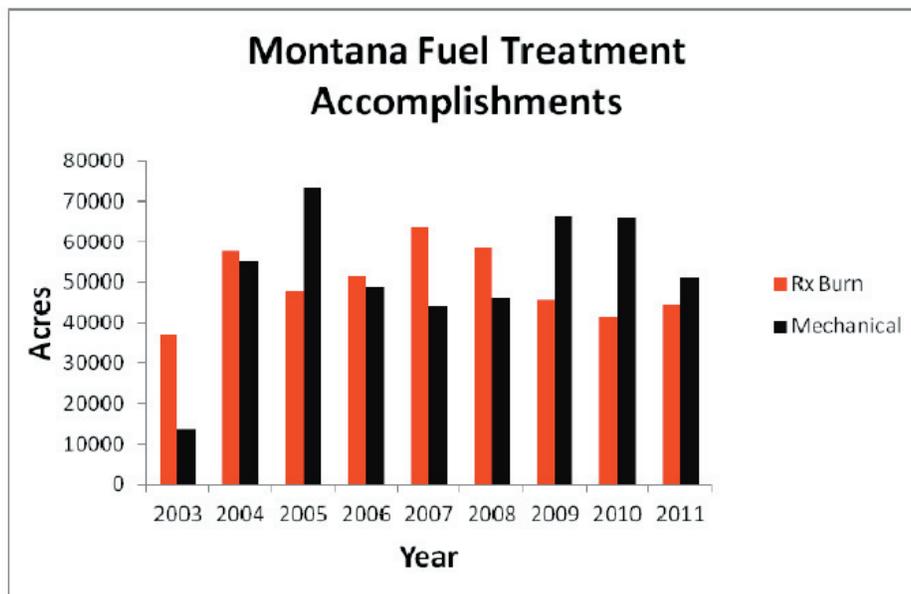


Figure 6. Fuels reduction accomplishments in the state of Montana. Mechanical treatment includes chainsaw or machine thinning, mastication or chipping. Most of the prescribed fire acres are pile burning of the biomass produced from the mechanical treatments. Source: www.forestrangelands.gov

Following successful mechanical treatments and pile burning, regularly scheduled maintenance burning is needed to prevent the current conditions from occurring again by keeping fuel accumulations low. The initial treatment requires significant investment, from \$400-\$1000 per acre (Table 1), in part due to lack of wood product markets for the trees cut (mostly trees from 1-15 inches). Maintenance burning should occur at intervals of approximately 10 years at an estimated cost of \$75 - \$150/acre.

Table 1. Treatment costs

Treatment Price Based on Existing DOI Contracts			
	Range	\$/acre	Proximate Condition
Hand Treatment (Cut, pile and burn)	Low	\$600.00	21 - 40 piles/acre
	High	\$1,000.00	61-80 piles/acre
Machine Cut and Pile	Low	\$300.00	<30% slope
	High	\$400.00	30% - 45% slope
RX Burn Low Complexity with Mop-up			No Mop-up
	Low	\$127.00	76 - 150 acres
	High	\$159.00	26 - 75 acres
			95
			74
RX Burn Moderate Complexity with Mop-up	Low	\$265.00	76 - 150 acres
	High	\$318.00	26 - 75 acres
			153
			137

Source: U.S Department of Interior Procurement Website. <http://www.blm.gov/or/procurement/firecontracts.php>

Currently, the main fuels reduction treatment on the Northern Cheyenne Reservation is pre-commercial thinning. However, it alone has not proven to mitigate the fuel hazard or prevent the occurrence of high-severity fire. Precommercial thinning is aimed at concentrating growth on fewer trees to increase the economic value of the stand by promoting more rapid growth on fewer trees. Precommercial thinning cuts very small trees (i.e. less than 7" dbh) but often does not sufficiently reduce the density of midsized trees to prevent the crown fires commonly occurring on the Reservation (photos). Preventing individual tree torching requires removal of ladder fuels that support transition of a surface fire to the tree crowns. At small scales this may be achieved but it does not prevent crown fires that begin in adjacent sites.

Precommercial thinning also results in significant slash (cut trees) left on the ground. Concurrent treatments generally include lop-and-scatter to reduce the depth of this new surface fuel load but the biomass still remains on-site. In the event that a fire occurs, research has shown that the increased fuel loading results in the same level of mortality as if the stand had no treatment at all. This has caused federal agencies to utilize a more comprehensive fuel reduction program that often includes piling of slash to reduce the fuel hazard. On the Northern Cheyenne Reservation, however, forest development funds (the funding source for precommercial thinning) apparently cannot be spent on slash disposal.

Suggested approach: make an intense, 15 year effort to reduce stand densities and hazardous fuels on the Northern Cheyenne Reservation.

The ponderosa pine forest covers 152,500 acres. Almost all of it is "commercial forest" in that it will be harvested over time. About 40% of it contains merchantable timber that is the focus of the harvests over the next 15 years. It also is a location of a major fuel hazard problem (see

photos). Another 40% is young plantation (or will soon be plantations), the result of past fires and an extensive replanting program. This is still part of the commercial forest but not scheduled for commercial harvest in the next 15 years. These plantations (see photos) have started to burn again, as the crowns grow and begin to touch each other. This problem will be especially severe because the trees were planted over slash from the salvage logging. A strategic plan to conserve the forests of the Northern Cheyenne must also include these young stands. The remaining 20% of the forest are pole stands or stands in the steep upper reaches of the watersheds, especially of the streams that drain into the Tongue River. On much of the Reservation, these stands are intermixed with the commercial forest discussed above. These stands also need to be part of any landscape-level fuel hazard reduction strategy.

Many landscape fuel treatment simulations of have been done across the West (Ager et al. 2007, 2010, Bevers et al. 2004, Collins et al. 2010, Finney et al. 2007). They generally show that the more area treated the greater effect they have on large fire behavior; however, treatments on 20-40% of the forest, placed strategically, such as along ridgetops, can reduce the spread rate of large fires and increase success in fighting these wildfires. For example, Finney et al. (2007) in a landscape simulation of fires in different Western landscapes, concluded that fuel treatments intended to disrupt the growth of large fires require at least one to two percent of the landscape to be treated each year. Treatment rates beyond 5% per year do not appear to improve fuel treatment effects. One to two percent per year of treatments strategically placed would provide optimally located fuel treatments on 20-40% of the landscape over a 20 year period; this will be effective at significantly reducing large fire growth. Almost double the treated area was found to be necessary if treatments are placed randomly on the landscape in the same analysis.

The most common recommendation on the magnitude of an effective fuel hazard strategy is to treat approximately 30% of the forest, with thought given of placement relative to wildfire spread and fire-fighting tactics. That would amount to $(30 * 152,500) = 45,000$ acres. These treatments would be spread over the forest, with many situated to help reduce the effects and spread of large wildfires, after landscape analysis to maximize their effect. It should be noted that the most recent BIA Forest Plan (2009) calls for up to 3,000 acres per year of fuel hazard reduction for 15 years or 45,000 acres during that period.

Given the critical condition of the Northern Cheyenne Forests and the fact that harvest placement rarely perfectly matches where the stands should be placed for maximum effect. it can be argued that 40% or more should be treated. That would call for treatment of 60,000 acres

Types of Treatments and Associated Costs

These treatments might be of three types: 1) Mechanical treatment, 2) Prescribed fire, and 3) Precommercial thinning. We will start with the one that is funded somewhat (precommercial thinning), that move on to a lower cost approach (prescribed fire), and finish with a higher cost approach (mechanical fuel treatments).

Precommercial thinning

Over 30,000 acres of commercial forest burned from 1985-2005 and have been regenerated (other forest was burned that was not commercial). In other cases, complete overstory removal and subsequent growth has left a dense young forest in which very few stems measure over 7" dbh. Many of these stands may be destroyed by fire unless thinning treatments are applied. In contrast to the uneven-aged, multi-story stands, precommercial thinning is an effective tool in these types of stands. Reducing stand density will improve tree vigor and the overall resistance

of the stand to wildfire. Also, fuel hazard monies should be used in these stands pile or lop-and-scatter the “activity fuels” created by putting little trees on the ground otherwise the cure can be worse than the problem.

As with the fuel reduction, precommercial thinning should not be uniform but rather should create patches and openings much like the spatial pattern of historical ponderosa pine forests. Current forest development funding allows precommercial thinning on approximately 750 acres per year, but forest development funding does not allow slash piling; thus an acre of precommercial thinning gets credit, in our analysis, for 2/3 acre since fuel hazard reduction funds for slash piling would also be needed. This would be equivalent to approximately 500 acres a year of fuel hazard treatment. Over 15 years, perhaps 7,500 acres could be added to fuel hazard treatments through PCT. It should be strategically placed among the vast sea of pine plantations created after recent fires, which would be very useful in breaking up the continuous fuels that these plantations currently or will soon provide. It is important to point out, though, that the effort to thin the ponderosa pine plantations should be secondary to the attempt to save the remaining historical forests of the Reservation.

Prescribed fire

As mentioned before, agencies have moved away from using prescribed fire before an initial mechanical treatment in dense conifer forests of the West due to the difficulty of controlling fire in such stands. Still, prescribed fire for fuels hazard reduction does have a role here and could make a modest contribution to the total acreage needed. Some areas have had thinning in the past and need an added treatment. Some other areas have lower stand densities due to low site or rocky soils. In both of these cases, prescribed fire might be employed after demonstration of its safety to the Tribal leadership.

Prescribed fire costs for those areas where it can be safely applied would be lower than mechanical treatment (Table 1). Discussions with local staff suggest that approximately 7,500 acres of prescribed fire might be applied to the more open stands.

Mechanical fuel treatment

A key issue is how much mechanical treatment will need to be done since it is generally more expensive to use than prescribed fire alone. Mechanical treatment involves cutting, mashing or chipping small trees but requires piling the slash that is created or using other approaches that breaks up the continuity of the surface fuels. After dealing with the activity fuels (the biomass created by the mechanical treatment), prescribed fire can be more safely employed to finish and maintain this effort.

Given that a total of 15,000 acres could be treated with precommercial thinning or prescribed fire over 15 years, mechanical treatment would be needed for either 30,000 acres or 45,000 acres, depending on whether 30% or 45% of the forest would be treated.

Treatment Summary

- Prescribed fire might be safely done as a first treatment on 5,000-7,500 acres (based on local knowledge) (we will use 7,500).
- Precommercial thinning at current rates might cover the equivalent of 7,500 acres over 15 years.
- The remaining 30,000 acres (for 30% treatment) or 45,000 acres (for 40% treatment) would be done mechanically.

The highest priority should be to locate treatments in stand with merchantable volume where ever possible. They contain the most valuable trees from both an economic and an ecological perspective.

The most effective type of thinning would emulate the historical spatial architecture of the ponderosa pine stands—a gappy spatial arrangement with clumps, dense patches and openings. This approach would better reflect the spatial arrangement of the historical forests than the “even-spacing” approach so often used and would maintain cover for big game. The BIA appears to recognize the value of such an approach. The 2009 Forest Plan states that “Scattered small openings will be created in the marking process to promote regeneration of ponderosa pine. In contrast to the traditional marking approach aimed at increasing the uniformity of spacing, occasional groups of trees will be left intact to maintain the inherently clumpy nature of many ponderosa pine stands.” Sound advice indeed!

Cost

Mechanical fuel treatment costs run from \$400-1000/acre, depending on how much hand work is needed and the amount of piling that must be done (Table 1). From a cost standpoint, mechanical treatment would be done in the relatively flat terrain, with hand work reserved for the steep slopes. Thus, a combination of hand and mechanical treatment would be needed on the Northern Cheyenne Reservation. We initially used an average cost of \$600. It might be slightly less depending on the how widely mechanical treatment can be applied.

It should be pointed out that hand work provides more employment opportunities. For many people on the Reservation, this work could be a primary source of employment.

Precommercial thinning should cost about the same amount per acre as mechanical fuel treatment when slash disposal is considered.

Prescribed fire costs from 100-300 per acre based on the complexity of the burn and how much mop-up is needed (how long the fire must be watched) (Table 1). We initially estimated this could be done at cost per acre of \$100, but it appears that the average cost would be somewhat higher (Table 1).

Treatment cost (30% of the forest treated)=

Prescribed fire costs + pre-commercial treatment costs + mechanical fuel treatment =
 $7,500 * \$100 + 7,500 * \$600 + 30,000 * \$600 = \$750,000 + \$4,500,000 + \$18,000,000 = \$23,250,000$

Added treatment funds needed = $\$23,250,000 - \$3,000,000$ (forest develop. pct for 15 years) =
 $\$20,250,000$

Treatment cost (40% of forest treated) =

Prescribed fire costs + pre-commercial treatment costs + mechanical fuel treatment =
 $7,500 * \$100 + 7,500 * \$600 + 45,000 * \$600 = \$750,000 + \$4,500,000 + \$27,000,000 =$
 $\$32,250,000$

Added treatment funds needed = $\$32,250,000 - \$3,000,000$ (forest develop. pct for 15 years) =
 $\$29,250,000$

This approach assumes that precommercial funds of \$3,000,000 from forest development over 15 years.

Inventory support

A one-time investment of approximately \$1,000,000 should be put into LiDAR data acquisition to obtain current forest conditions so treatments can be allocated on the landscape in the most effective manner. LiDAR (light detection and ranging) is a tool that can provide very precise, accurate and high-resolution images of the surface of the ground and the vegetation. In addition to helping prioritize hazardous fuel treatments, LiDAR data can help map roads, streams, and landforms locate landslides, measure individual trees and fuel structure throughout the forest, support archeological investigations, assist in modeling floods and floodplains and support cadastral surveys for Tribal housing plans.

Cost summary

Substantially reducing the risk that the Northern Cheyenne Forests will be lost to wildfire in the near future will require an investment of 20-30 million dollars over 15 years. Because some work has been done in the past and very recently burned areas may need limited treatment, an investment of approximately 20 million dollars may suffice.

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**Comment on the Socio-Economic Impacts of the
Tongue River Railroad and Associated Coal Mines and
Its Treatment in the Draft Environmental Impact
Statement**

Power Consulting Incorporated

**Thomas Michael Power, PhD
Donovan S. Power, MS**

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About the Authors:

Thomas Michael Power is the Principal in Power Consulting, Inc. and a Research Professor and Professor Emeritus in the Economics Department at the University of Montana where he has been a researcher, teacher, and administrator for almost 50 years. He received his undergraduate degree in Physics from Lehigh University and his MA and PhD in Economics from Princeton University.

Donovan S. Power received his undergraduate degree in Geosciences at the University of Montana and his MS in Geology from the University of Washington. He has been the principal scientist at Power Consulting, Inc. for the past seven years.

Executive Summary

Introduction

The Northern Cheyenne Tribe asked Power Consulting to review the *socioeconomic analysis* found in the Tongue River Railroad (TRRR) Draft Environmental Impact Statement (DEIS) to determine whether it adequately and accurately analyzed the potential impacts of the TRRR and its associated coal mines on the Northern Cheyenne and their Reservation.

This report contains Power Consulting's analysis and conclusions about the adequacy and accuracy of the socioeconomic analysis contained in the TRRR DEIS. In addition, since the DEIS did not provide information on the socioeconomic characteristics of the Northern Cheyenne and their Reservation, the report also provides that basic socioeconomic information. Also, since the TRRR DEIS did not analyze the impact of the last coal boom in the region adjacent to the Northern Cheyenne Reservation on socioeconomic conditions for lessons on how new coal development might impact the Northern Cheyenne and their Reservation, this report also provides that analysis.

Summary of Conclusions

The socioeconomic data and analysis in this report supports the following conclusions:

- i *The Northern Cheyenne and their Reservation were largely ignored in the TRRR DEIS socioeconomic analysis. This prevents potential differential impacts of new coal development on Northern Cheyenne and others from being understood.*

The socioeconomic analysis in the TRRR DEIS made almost no attempt to identify any unique socioeconomic aspects of the Northern Cheyenne Reservation and its residents. In fact, that TRRR DEIS socioeconomic analysis rarely mentions the Northern Cheyenne. As a result, the Northern Cheyenne are implicitly combined with the overall population of a four or nine-county study area in the DEIS's socioeconomic analysis.

This effectively obscures the socioeconomic vulnerability of the Northern Cheyenne and increases the likelihood that the Northern Cheyenne could be harmed by off-reservation coal development and face barriers to sharing in the potentially positive impacts of that coal development. Over the last half-century a significant professional socioeconomic literature has developed focused on a more sophisticated understanding of the impacts of energy booms and their unequal distribution of costs and benefits among residents. The DEIS failed to make use of that extensive literature.

This failure to attempt to learn from past experiences with energy development booms is all the more puzzling given the widespread discussion, both in the popular press and in professional studies, of the contemporary Bakken energy boom in western North Dakota and eastern Montana.

- ii *The TRRR DEIS was structured in a way that led to serious understatements of socioeconomic impacts.*

The chapter and technical appendix labeled “Socioeconomics” in the TRRR DEIS concludes that there will be only modest socioeconomic impacts associated with the construction and operation of the TRRR. The economic changes “would not be sufficient to alter the current population and economic trends in the study area.” (p. 15-1). That Socioeconomics chapter in the DEIS concluded that once the TRRR was constructed and operating, only 54 additional jobs would be created and the population of the four-county study area would increase, at most, by 70 new residents. Clearly, if this were the impact of building and operating the TRRR, the impact would, in fact, cause no social or economic disruption.

The DEIS Socioeconomic chapter was able to come to this conclusion only because it did not take into account the impact of the new coal mines that the TRRR was intended to make feasible and bring into existence. Those impacts of the TRRR-related coal mines were discussed only briefly in an entirely different chapter and technical appendix, both titled “Cumulative Impacts.” Those parts of the TRRR DEIS projected very significant socioeconomic impacts from the new coal mines: Depending on the level of coal production at the coal mines brought into existence by the TRRR, the increase in the population of the area would be between about 2,000 and 7,000, thirty to one hundred times what the DEIS Socioeconomic chapter concluded would be the impact of the TRRR.

The conclusions of the DEIS Socioeconomic chapter are clearly in error, significantly understating the impacts of the TRRR and the coal mines it is intended to bring into existence.

- iii *The TRRR DEIS assumes that job, payroll, population, and local government tax revenues increases are sufficient measures of the overall positive socioeconomic impacts of coal development.*

Without analysis or discussion, the TRRR DEIS simply assumes that the projected increased employment, payroll, population, and local government tax revenues that result from the new coal development are convincing evidence of the likelihood of overall improvement in socioeconomic conditions. As discussed above, this ignores the professional literature that for five decades has tried to understand the mixed impacts of natural resource booms on local communities. “A rising tide lifts all ships” is not an economic principle supported by the empirical analysis of past energy booms. Given the existence of a large vulnerable minority population adjacent to the proposed coal

developments and the facilitating railroad, professionally sophisticated analysis of expected impacts was called for. The TRRR DEIS did not provide that.

- iv *Analysis of the current socioeconomic conditions on the Northern Cheyenne Reservation indicates that it is not similar to the non-Reservation part of Rosebud County. As a result, the focus of the DEIS socioeconomic analysis on the general characteristics of the study area population does not provide an accurate socioeconomic description of the Reservation and does not lay the basis for understanding the likely impacts of new coal development on the Reservation's residents.*

An analysis of the socioeconomic characteristics of the Northern Cheyenne Reservation compared to the off-Reservation part of Rosebud County reveals the following differences based on the 2010 Census and other Census Bureau data.

- a. The Reservation is 91 percent American Indian while the non-Reservation part of Rosebud County is 94 percent white.
- b. The Reservation is much more densely settled than the non-Reservation part of Rosebud County: 6.8 persons per square mile on the Reservation compared to 1.3 persons off the Reservation. This reflects the Northern Cheyenne commitment to their homeland despite its limited economic opportunities.
- c. The Reservation has a much younger population with more children and people in school while the non-Reservation part of Rosebud County has an older population with significantly more people over age 45. The median age on the Reservation was about 23 while the median age in the non-Reservation part of Rosebud County was about 44.
- d. The average income per person and median household income on the Reservation were both only about half those in non-Reservation Rosebud County.
- e. The poverty rate on the Northern Cheyenne Reservation was almost 35 percent while the poverty rate in off-Reservation Rosebud County was 9 percent.
- f. The “official” unemployment rate on the Northern Cheyenne Reservation was almost 27 percent, which was almost 14 times the unemployment rate in Rosebud County off the Reservation, which was about 2 percent.¹

¹The official U.S. unemployment rate calculation applied to Indian Reservations produces a much lower unemployment rate than that measured and published in the past by the Bureau of Indian Affairs. We will discuss these two different approaches to measuring the extent of unemployment in the main body of this report. Since we wish to compare the unemployment rate on the Northern Cheyenne Reservation with that off the Reservation and since the unemployment rate most citizens are familiar with is the official

- g. Educational achievement on the Reservation is both higher and lower than that of the off-Reservation Rosebud County population. On the Reservation the percentage who did not graduate from high school is almost twice as high as off-Reservation Rosebud County. On the other hand, the percentage that have some college, including those with a college degree, is similar, slightly over half for both the on and off the Reservation populations.
 - h. The financial reward for educational attainment on the Reservation, however, was significantly lower than off the Reservation in Rosebud County except for those with an advanced degree. Those with advanced degrees received similar pay on the Reservation and off the Reservation in Rosebud County. Those with less than a high school education on the Reservation earned only about 30 percent of what those off the Reservation in Rosebud County earned. Those on the Reservation with high school diplomas or some college but not a bachelor's degrees earned about 25 percent less than those off the Reservation in Rosebud County with similar educational attainment. Those with bachelor's degrees on the Reservation earned about 12 percent less than those off the Reservation in Rosebud County with a Bachelor's degree.
- v *The previous coal boom in the same region in the 1972-1990 period failed to have the positive impacts on the Northern Cheyenne that the TRRR DEIS now projects will be associated with the new coal development that would be associated with the TRRR.*

During the 1970s and 1980s a half-dozen new coal mines and four coal-fired electric generators were constructed in the region surrounding the Northern Cheyenne Reservation. The result was a massive increase in employment, payroll, and population in that region. Despite that major coal development, the socioeconomic status of Reservation residents was static or deteriorated, especially relative to the socioeconomic conditions across Rosebud County as a whole.

During that boom period, the unemployment rate ballooned from 7 percent to 17 percent. Median family income declined 17 percent when adjusted for inflation. Relative to Rosebud County as a whole, median family income went from 90 percent of the county average to 45 percent. The poverty rate also increased from about 40 percent to almost 50 percent. Home ownership fell from about 80 percent to about 60 percent. See Table ES-1.

unemployment rate issued monthly by the U.S. Bureau of Labor Statistics, we will use the "official" approach to measuring unemployment in this report but will also discuss the BIA's measure.