

14G. Sediment/Nutrient/Toxicant Retention and Removal: (Applies to wetlands with potential to receive sediments, nutrients, or toxicants through influx of surface or ground water or direct input. If no wetlands in the AA are subject to such input, circle **NA** here and proceed to 14H.)

I. Rating (working from top to bottom, use the matrix below to arrive at [circle] the functional points and rating [H = high, M = moderate, or L = low])

Sediment, nutrient, and toxicant input levels within AA	AA receives or surrounding land use with potential to deliver levels of sediments, nutrients, or compounds at levels such that other functions are not substantially impaired. Minor sedimentation, sources of nutrients or toxicants, or signs of eutrophication present.				Waterbody on MDEQ list of waterbodies in need of TMDL development for "probable causes" related to sediment, nutrients, or toxicants or AA receives or surrounding land use with potential to deliver high levels of sediments, nutrients, or compounds such that other functions are substantially impaired. Major sedimentation, sources of nutrients or toxicants, or signs of eutrophication present.			
	> 70%		< 70%		> 70%		< 70%	
% cover of wetland vegetation in AA	Yes	No	Yes	No	Yes	No	Yes	No
Evidence of flooding / ponding in AA	1H	.8H	.7M	.5M	.5M	.4M	.3L	.2L
AA contains no or restricted outlet	.9H	.7M	.6M	.4M	.4M	.3L	.2L	.1L
AA contains unrestricted outlet								

Comments:

14H Sediment/Shoreline Stabilization: (Applies only if AA occurs on or within the banks of a river, stream, or other natural or man-made drainage, or on the shoreline of a standing water body which is subject to wave action. If 14H does not apply, circle **NA** here and proceed to 14I.)

I. Rating (working from top to bottom, use the matrix below to arrive at [circle] the functional points and rating)

% Cover of <u>wetland</u> streambank or shoreline by species with stability ratings of ≥ 6 (see Appendix F)	Duration of surface water adjacent to rooted vegetation		
	Permanent / Perennial	Seasonal / Intermittent	Temporary / Ephemeral
≥ 65%	1H	.9H	.7M
35-64%	.7M	.6M	.5M
< 35%	.3L	.2L	.1L

Comments:

14I. Production Export/Food Chain Support:

I. Level of Biological Activity (synthesis of wildlife and fish habitat ratings [circle])

General Fish Habitat Rating (14D.iii.)	General Wildlife Habitat Rating (14C.iii.)		
	E/H	M	L
E/H	H	H	M
M	H	M	M
L	M	M	L
N/A	H	M	L

ii. Rating (Working from top to bottom, use the matrix below to arrive at [circle] the functional points and rating. Factor A = acreage of vegetated wetland component in the AA; Factor B = level of biological activity rating from above (14I.i.); Factor C = whether or not the AA contains a surface or subsurface outlet; the final three rows pertain to duration of surface water in the AA, where P/P, S/I, and T/E are as previously defined, and A = "absent" [see instructions for further definitions of these terms].)

A	Vegetated component >5 acres						Vegetated component 1-5 acres						Vegetated component <1 acre					
	High		Moderate		Low		High		Moderate		Low		High		Moderate		Low	
B	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No
C	1H	.7M	.8H	.5M	.6M	.4M	.9H	.6M	.7M	.4M	.5M	.3L	.8H	.6M	.6M	.4M	.3L	.2L
P/P	.9H	.6M	.7M	.4M	.5M	.3L	.8H	.5M	.6M	.3L	.4M	.2L	.7M	.5M	.5M	.3L	.3L	.2L
S/I	.8H	.5M	.6M	.3L	.4M	.2L	.7M	.4M	.5M	.2L	.3L	.1L	.6M	.4M	.4M	.2L	.2L	.1L
T/E/A																		

iii. Modified Rating (NOTE: Modified score cannot exceed 1 or be less than 0.1.) **Vegetated Upland Buffer (VUB):** Area with ≥ 30% plant cover, ≤ 15% noxious weed or ANVS cover, and that is not subjected to periodic mechanical mowing or clearing (unless for weed control).

a) Is there an average ≥ 50 foot-wide vegetated upland buffer around ≥ 75% of the AA circumference? (Y) N If yes, add 0.1 to the score in ii above and adjust rating accordingly: 1.0

iv. Final Score and Rating: 1.1 Comments:

14J. Groundwater Discharge/Recharge: (check the appropriate indicators in i & ii below) N/A

- i. Discharge Indicators**
- ☐ The AA is a slope wetland
 - ☐ Springs or seeps are known or observed
 - ☐ Vegetation growing during dormant season/drought
 - ☐ Wetland occurs at the toe of a natural slope
 - ☐ Seeps are present at the wetland edge
 - ☐ AA permanently flooded during drought periods
 - ☐ Wetland contains an outlet, but no inlet
 - ☐ Shallow water table and the site is saturated to the surface
 - ☐ Other: _____

- ii. Recharge Indicators**
- ☐ Permeable substrate present without underlying impeding layer
 - ☐ Wetland contains inlet but no outlet
 - ☐ Stream is a known 'losing' stream; discharge volume decreases
 - ☐ Other: _____

iii. **Rating** (use the information from i and ii above and the table below to arrive at [circle] the functional points and rating)

Criteria	Duration of saturation at AA Wetlands FROM GROUNDWATER DISCHARGE OR WITH WATER THAT IS RECHARGING THE GROUNDWATER SYSTEM			
	P/P	S/I	T	None
Groundwater Discharge or Recharge	1H	.7M	.4M	.1L
Insufficient Data/Information	N/A			

Comments:

14K. Uniqueness:

i. **Rating** (working from top to bottom, use the matrix below to arrive at [circle] the functional points and rating)

Replacement potential	AA contains fen, bog, warm springs or mature (>80 yr-old) forested wetland or plant association listed as "S1" by the MTNHP			AA does not contain previously cited rare types and structural diversity (#13) is high or contains plant association listed as "S2" by the MTNHP			AA does not contain previously cited rare types or associations and structural diversity (#13) is low-moderate		
	rare	common	abundant	rare	common	abundant	rare	common	abundant
Estimated relative abundance (#11)	1H	.9H	.8H	.8H	.6M	.5M	.5M	.4M	.3L
Low disturbance at AA (#12i)	.9H	.8H	.7M	.7M	.5M	.4M	.4M	.3L	.2L
Moderate disturbance at AA (#12i)	.8H	.7M	.6M	.6M	.4M	.3L	.3L	.2L	.1L
High disturbance at AA (#12i)									

Comments:

14L. Recreation/Education Potential: (affords "bonus" points if AA provides recreation or education opportunity)

i. Is the AA a known or potential rec./ed. site: (circle) **Y** **N** (if 'Yes' continue with the evaluation; if 'No' then circle **NA** here and proceed to the overall summary and rating page)

ii. Check categories that apply to the AA: ☐ Educational/scientific study; ☒ Consumptive rec.; ☒ Non-consumptive rec.; ☐ Other

iii. **Rating** (use the matrix below to arrive at [circle] the functional points and rating)

Known or Potential Recreation or Education Area	Known	Potential
Public ownership or public easement with general public access (no permission required)	.2H	.15H
Private ownership with general public access (no permission required)	.15H	.1M
Private or public ownership without general public access, or requiring permission for public access	.1M	.05L

Comments:

General Site Notes

Site is a small section of larger floodplain on river left of the Tongue River. Area assessed is bottom. Remaining flood plain is either connected or riparian area that was not assessed during field visit, since field visit was focusing on wetlands.

FUNCTION & VALUE SUMMARY & OVERALL RATING FOR WETLAND/SITE #(S): McRae 01

Function & Value Variables	Rating	Actual Functional Points	Possible Functional Points	Functional Units: (Actual Points x Estimated AA Acreage)	Indicate the four most prominent functions with an asterisk (*)
A. Listed/Proposed T&E Species Habitat	L	0.1	1		
B. MT Natural Heritage Program Species Habitat	M	0.7	1		
C. General Wildlife Habitat	H	0.9	1		
D. General Fish Habitat	M	0.7	1		
E. Flood Attenuation	M	0.7	1		
F. Short and Long Term Surface Water Storage	H	0.8	1		
G. Sediment/Nutrient/Toxicant Removal	H	0.9	1		
H. Sediment/Shoreline Stabilization	H	1	1		
I. Production Export/Food Chain Support	H	1.1	1		
J. Groundwater Discharge/Recharge	N/A				
K. Uniqueness	L	0.3	1		
L. Recreation/Education Potential (bonus points)	H	0.15	NA		
Totals:		7.35	10		
Percent of Possible Score			73.5 %		

Category I Wetland: (must satisfy **one** of the following criteria; otherwise go to Category II)

- ☐ Score of 1 functional point for Listed/Proposed Threatened or Endangered Species; **or**
- ☐ Score of 1 functional point for Uniqueness; **or**
- ☐ Score of 1 functional point for Flood Attenuation **and** answer to Question 14E.ii is "yes"; **or**
- ☐ Percent of possible score > 80% (round to nearest whole #).

Category II Wetland: (Criteria for Category I not satisfied **and** meets any **one** of the following criteria; otherwise go to Category IV)

- ☒ Score of 1 functional point for MT Natural Heritage Program Species Habitat; **or**
- ☐ Score of .9 or 1 functional point for General Wildlife Habitat; **or**
- ☐ Score of .9 or 1 functional point for General Fish Habitat; **or**
- ☐ "High" to "Exceptional" ratings for **both** General Wildlife Habitat **and** General Fish/Aquatic Habitat; **or**
- ☐ Score of .9 functional point for Uniqueness; **or**
- ☒ Percent of possible score > 65% (round to nearest whole #).

Category III Wetland: (Criteria for Categories I, II, or IV not satisfied)

Category IV Wetland: (Criteria for Categories I or II are not satisfied and all of the following criteria are met; otherwise go to Category III)

- ☐ "Low" rating for Uniqueness; **and**
- ☐ Vegetated wetland component < 1 acre (do not include upland vegetated buffer); **and**
- ☐ Percent of possible score < 35% (round to nearest whole #).

OVERALL ANALYSIS AREA RATING: (circle appropriate category based on the criteria outlined above) I II III IV

1. Project Name: Tongue River Railroad Corridor 2. MDT Project #: _____ Control #: _____
3. Evaluation Date: Mo 07 Day 15 Yr. 2018 4. Evaluator(s): K. Rasmussen 5. Wetlands/Site #(s): MCRoe-02
6. Wetland Location(s): i. Legal: T ____ N or S; R ____ E or W; S ____ ; T ____ N or S; R ____ E or W; S ____
ii. Approx. Stationing or Mileposts: _____
iii. Watershed: _____ Watershed Name, County: _____

7. a. Evaluating Agency: Cum; 1,830 x 40
 b. Purpose of Evaluation:
 1. ☐ Wetlands potentially affected by MDT project
 2. ☐ Mitigation wetlands; pre-construction
 3. ☐ Mitigation wetlands; post-construction
 4. ☒ Other Traverse River Rail Road
8. Wetland size: (total acres) 21.7 (visually estimated) 1,830 x 40
 (measured, e.g. by GPS [if applies])
9. Assessment area (AA): (acres, 0.37 (visually estimated) 535 x 30
 see instructions on determining AA) (measured, e.g. by GPS [if applies])

HGM Class (Brinson)	Class (Cowardin)	Modifier (Cowardin)	Water Regime	% of AA
S	EM	h	C	65
S	EM	h	B	30
S	AB	h	F	5

HGM Classes: Riverine (R), Depressional (D), Slope (S), Mineral Soil Flats (MSF), Organic Soil Flats (OSF), Lacustrine Fringe (LF);

Cowardin Classes: Rock Bottom (RB), Unconsolidated bottom (UB), Aquatic Bed (AB), Unconsolidated Shore (US), Moss-lichen Wetland (ML), Emergent Wetland (EM), Scrub-Shrub Wetland (SS), Forested Wetland (FO)

Modifiers: Excavated (E), Impounded (I), Diked (D), Partly Drained (PD), Farmed (F), Artificial (A)

Water Regimes: Permanent / Perennial (PP), Seasonal / Intermittent (SI), Temporary / Ephemeral (TE)

- 12. General condition of AA:**

- I. **Disturbance:** (use matrix below to determine [circle] appropriate response – see instructions for Montana-listed noxious weed and aquatic nuisance vegetation species (ANVS) lists)

nuisance vegetation species (ANVS) lists	Predominant conditions adjacent to (within 500 feet of) AA		
	Managed in predominantly natural state, is not grazed, hayed, logged, or otherwise converted; does not contain roads or buildings; and noxious weed or ANVS cover is ≤15%	Land not cultivated, but may be moderately grazed or hayed or selectively logged; or has been subject to minor clearing; contains few roads or buildings; noxious weed or ANVS cover is ≤30%	Land cultivated or heavily grazed or logged; subject to substantial fill placement, grading, clearing, or hydrological alteration; high road or building density; or noxious weed or ANVS cover is >30%
Conditions within AA			
AA occurs and is managed in predominantly natural state; is not grazed, hayed, logged, or otherwise converted; does not contain roads or occupied buildings; and noxious weed or ANVS cover is ≤15%	low disturbance	low disturbance	moderate disturbance
AA not cultivated, but may be moderately grazed or hayed or selectively logged, or has been subject to relatively minor clearing, fill placement, or hydrological alteration; contains few roads or buildings; noxious weed or ANVS cover is ≤30%	moderate disturbance	moderate disturbance	high disturbance
AA cultivated or heavily grazed or logged; subject to relatively substantial fill placement, grading, clearing, or hydrological alteration; high road or building density; or noxious weed or	high disturbance	high disturbance	high disturbance

Comments: (types of disturbance, intensity, season, etc.): no evidence of cows grazing in wetland
But there is a well that diverts spring water for livestock use

ii. Prominent noxious, aquatic nuisance, & other exotic vegetation species: *Cirsium arvense*, *Cirsium vulgare*, *Poa pratensis* - outside AA

iii. Provide brief descriptive summary of AA and surrounding land use/habitat:

13. **Structural Diversity:** (based on number of "Cowardin" *vegetated* classes present [do not include unvegetated classes], see #10 above)

Existing # of "Cowardin" Vegetated Classes in AA	Initial Rating	Is current management preventing (passive) existence of additional vegetated classes?	Modified Rating
23 (or 2 if 1 is forested) classes	H	NA	NA
2 (or 1 if forested) classes	M	NA	NA
1 class, but not a monoculture	M	←NO	YES→ L
1 class, monoculture (1 species comprises ≥90% of total cover)	L	NA	NA

Comments:

SECTION PERTAINING TO FUNCTIONS & VALUES ASSESSMENT

14A. Habitat for Federally Listed or Proposed Threatened or Endangered Plants or Animals:

i. AA is Documented (D) or Suspected (S) to contain (circle one based on definitions contained in instructions):

Primary or critical habitat (list species)	D S	_____
Secondary habitat (list species)	D S	_____
Incidental habitat (list species)	D S	_____
No usable habitat	(S)	_____

ii. **Rating** (use the conclusions from i above and the matrix below to arrive at [circle] the functional points and rating)

Highest Habitat Level	doc/primary	sus/primary	doc/secondary	sus/secondary	doc/incidental	sus/incidental	None
Functional Points and Rating	1H	.9H	.8M	.7M	.3L	.1L	0L

Sources for documented use (e.g. observations, records, etc.):

14B. Habitat for plant or animals rated S1, S2, or S3 by the Montana Natural Heritage Program: (not including species listed in 14A above)

i. AA is Documented (D) or Suspected (S) to contain (circle one based on definitions contained in instructions):

Primary or critical habitat (list species)	D S	_____
Secondary habitat (list species)	D (S)	great spruce forest, plains spruce forest
Incidental habitat (list species)	D S	_____
No usable habitat	S	_____

ii. **Rating** (use the conclusions from i above and the matrix below to arrive at [circle] the functional points and rating)

Highest Habitat Level	doc/primary	sus/primary	doc/secondary	sus/secondary	doc/incidental	sus/incidental	None
S1 Species:							
Functional Points and Rating	1H	.8H	.7M	.6M	.2L	.1L	0L
S2 and S3 Species:							
Functional Points and Rating	.9H	.7M	.6M	.5M	.2L	.1L	0L

Sources for documented use (e.g. observations, records, etc.):

14C. General Wildlife Habitat Rating:

i. **Evidence of overall wildlife use in the AA** (circle substantial, moderate, or low based on supporting evidence):

Substantial (based on any of the following [check]):

- ☐ observations of abundant wildlife #s or high species diversity (during any period)
- ☐ abundant wildlife sign such as scat, tracks, nest structures, game trails, etc.
- ☐ presence of extremely limiting habitat features not available in the surrounding area
- ☐ interviews with local biologists with knowledge of the AA

Minimal (based on any of the following [check]):

- ☐ few or no wildlife observations during peak use periods
- ☐ little to no wildlife sign
- ☐ sparse adjacent upland food sources
- ☐ interviews with local biologists with knowledge of the AA

Moderate (based on any of the following [check]):

- ☒ observations of scattered wildlife groups or individuals or relatively few species during peak periods
- ☒ common occurrence of wildlife sign such as scat, tracks, nest structures, game trails, etc.
- ☒ adequate adjacent upland food sources
- ☐ interviews with local biologists with knowledge of the AA

ii. **Wildlife habitat features** (Working from top to bottom, circle appropriate AA attributes in matrix to arrive at rating. Structural diversity is from #13. For class cover to be considered evenly distributed, the most and least prevalent **vegetated** classes must be within 20% of each other in terms of their percent composition of the AA (see #10). Abbreviations for surface water durations are as follows: P/P = permanent/perennial; S/I = seasonal/intermittent; T/E = temporary/ephemeral; and A = absent [see instructions for further definitions of these terms])

Structural diversity (see #13)	High								Moderate								Low			
	Even				Uneven				Even				Uneven				Even			
Class cover distribution (all vegetated classes)	P/P	S/I	T/E	A	P/P	S/I	T/E	A	P/P	S/I	T/E	A	P/P	S/I	T/E	A	P/P	S/I	T/E	A
Duration of surface water in ≥ 10% of AA	P/P	S/I	T/E	A	P/P	S/I	T/E	A	P/P	S/I	T/E	A	P/P	S/I	T/E	A	P/P	S/I	T/E	A
Low disturbance at AA (see #12i)	E	E	E	H	E	E	H	H	E	H	H	M	E	H	M	M	E	H	M	M
Moderate disturbance at AA (see #12i)	H	H	H	H	H	H	H	M	H	H	M	M	H	M	M	L	H	M	L	L
High disturbance at AA (see #12i)	M	M	M	L	M	M	L	L	M	M	L	L	M	L	L	L	L	L	L	L

iii. **Rating** (use the conclusions from i and ii above and the matrix below to arrive at [circle] the functional points and rating)

Evidence of wildlife use (i)	Wildlife habitat features rating (ii)			
	Exceptional	High	Moderate	Low
Substantial	1E	.9H	.8H	.7M
Moderate	.9H	.7M	.5M	.3L
Minimal	.6M	.4M	.2L	.1L

Comments:

14D. General Fish Habitat Rating: (Assess this function if the AA is used by fish or the existing situation is "correctable" such that the AA could be used by fish [i.e., fish use is precluded by perched culvert or other barrier, etc.]. If the AA is not used by fish, fish use is not restorable due to habitat constraints, or is not desired from a management perspective [such as fish entrapped in a canal], then circle **NA** here and proceed to 14E.)

Type of Fishery: Cold Water (CW) _____ Warm Water (WW) _____ Use the CW or WW guidelines in the user manual to complete the matrix

i. Habitat Quality and Known / Suspected Fish Species in AA (use matrix to arrive at [circle] the functional points and rating)

Duration of surface water in AA	Permanent / Perennial						Seasonal / Intermittent						Temporary / Ephemeral					
	Optimal		Adequate		Poor		Optimal		Adequate		Poor		Optimal		Adequate		Poor	
Aquatic hiding / resting / escape cover	O	S	O	S	O	S	O	S	O	S	O	S	O	S	O	S	O	S
Thermal cover optimal / suboptimal	O	S	O	S	O	S	O	S	O	S	O	S	O	S	O	S	O	S
FWP Tier I fish species	1E	.9H	.8H	.7M	.6M	.5M	.9H	.8H	.7M	.6M	.5M	.4M	.7M	.6M	.5M	.4M	.3L	.3L
FWP Tier II or Native Game fish species	.9H	.8H	.7M	.6M	.5M	.5M	.8H	.7M	.6M	.5M	.4M	.4M	.6M	.5M	.4M	.3L	.2L	.2L
FWP Tier III or Introduced Game fish	.8H	.7M	.6M	.5M	.5M	.4M	.7M	.6M	.5M	.4M	.4M	.3L	.5M	.4M	.3L	.2L	.2L	.1L
FWP Non-Game Tier IV or No fish species	.5M	.5M	.5M	.4M	.4M	.3L	.4M	.4M	.4M	.3L	.3L	.2L	.2L	.2L	.2L	.1L	.1L	.1L

Sources used for identifying fish sp. potentially found in AA:

ii. **Modified Rating** (NOTE: Modified score cannot exceed 1 or be less than 0.1)

a) Is fish use of the AA significantly reduced by a culvert, dike, or other man-made structure or activity or is the waterbody included on the current final MDEQ list of waterbodies in need of TMDL development with listed "Probable Impaired Uses" including cold or warm water fishery or aquatic life support, or do aquatic nuisance plant or animal species (see Appendix E) occur in fish habitat? **Y N** If yes, reduce score in i above by 0.1: _____

b) Does the AA contain a documented spawning area or other critical habitat feature (i.e., sanctuary pool, upwelling area, etc.- specify in comments) for native fish or introduced game fish? **Y N** If yes, add 0.1 to the adjusted score in i or iia above: _____

iii. **Final Score and Rating:** _____ **Comments:** _____

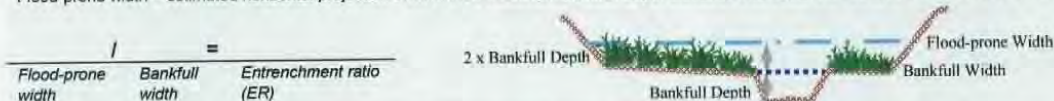
14E. Flood Attenuation: (Applies only to wetlands subject to flooding via in-channel or overbank flow. If wetlands in AA are not flooded from in-channel or overbank flow, circle **NA** here and proceed to 14F.)

i. Rating (working from top to bottom, use the matrix below to arrive at [circle] the functional points and rating)

Estimated or Calculated Entrenchment (Rosgen 1994, 1996)	Slightly entrenched - C, D, E stream types			Moderately entrenched - B stream type			Entrenched-A, F, G stream types		
	75%	25-75%	<25%	75%	25-75%	<25%	75%	25-75%	<25%
AA contains no outlet or restricted outlet	1H	.9H	.6M	.8H	.7M	.5M	.4M	.3L	.2L
AA contains unrestricted outlet	.9H	.8H	.5M	.7M	.6M	.4M	.3L	.2L	.1L

Entrenchment ratio (ER) estimation – see User's Manual for additional guidance. Entrenchment ratio = (flood-prone width)/(bankfull width)

Flood-prone width = estimated horizontal projection of where 2 x maximum bankfull depth elevation intersects the floodplain on each side of the stream.



Slightly Entrenched ER = >2.2			Moderately Entrenched ER = 1.41 – 2.2		Entrenched ER = 1.0 – 1.4		
C stream type	D stream type	E stream type	B stream type		A stream type	F stream type	G stream type

ii. Are ≥10 acres of wetland in the AA subject to flooding **AND** are man-made features which may be significantly damaged by floods located within 0.5 mile downstream of the AA (circle)? **Y N** **Comments:** _____

14F. Short and Long Term Surface Water Storage: (Applies to wetlands that flood or pond from overbank or in-channel flow, precipitation, upland surface flow, or groundwater flow. If no wetlands in the AA are subject to flooding or ponding, circle **NA** here and proceed to 14G.)

i. Rating (Working from top to bottom, use the matrix below to arrive at [circle] the functional points and rating. Abbreviations for surface water durations are as follows: P/P = permanent/perennial; S/I = seasonal/intermittent; and T/E = temporary/ephemeral [see instructions for further definitions of these terms].)

Estimated maximum acre feet of water contained in wetlands within the AA that are subject to periodic flooding or ponding	>5 acre feet			1.1 to 5 acre feet			≤1 acre foot		
	P/P	S/I	T/E	P/P	S/I	T/E	P/P	S/I	T/E
Duration of surface water at wetlands within the AA	P/P	S/I	T/E	P/P	S/I	T/E	P/P	S/I	T/E
Wetlands in AA flood or pond ≥ 5 out of 10 years	1H	.9H	.8H	.8H	.6M	.5M	.4M	.3L	.2L
Wetlands in AA flood or pond < 5 out of 10 years	.9H	.8H	.7M	.7M	.5M	.4M	.3L	.2L	.1L

Comments: _____

14G. Sediment/Nutrient/Toxicant Retention and Removal: (Applies to wetlands with potential to receive sediments, nutrients, or toxicants through influx of surface or ground water or direct input. If no wetlands in the AA are subject to such input, circle **NA** here and proceed to 14H.)

i. Rating (working from top to bottom, use the matrix below to arrive at [circle] the functional points and rating [H = high, M = moderate, or L = low])

Sediment, nutrient, and toxicant input levels within AA	AA receives or surrounding land use with potential to deliver levels of sediments, nutrients, or compounds at levels such that other functions are not substantially impaired. Minor sedimentation, sources of nutrients or toxicants, or signs of eutrophication present.				Waterbody on MDEQ list of waterbodies in need of TMDL development for "probable causes" related to sediment, nutrients, or toxicants or AA receives or surrounding land use with potential to deliver high levels of sediments, nutrients, or compounds such that other functions are substantially impaired. Major sedimentation, sources of nutrients or toxicants, or signs of eutrophication present.			
	≥ 70%		< 70%		≥ 70%		< 70%	
Evidence of flooding / ponding in AA	Yes	No	Yes	No	Yes	No	Yes	No
AA contains no or restricted outlet	1H	.8H	.7M	.5M	.5M	.4M	.3L	.2L
AA contains unrestricted outlet	.9H	.7M	.6M	.4M	.4M	.3L	.2L	.1L

Comments:

14H Sediment/Shoreline Stabilization: (Applies only if AA occurs on or within the banks of a river, stream, or other natural or man-made drainage, or on the shoreline of a standing water body which is subject to wave action. If 14H does not apply, circle **NA** here and proceed to 14I.)

i. Rating (working from top to bottom, use the matrix below to arrive at [circle] the functional points and rating)

% Cover of wetland streambank or shoreline by species with stability ratings of ≥ 6 (see Appendix F).	Duration of surface water adjacent to rooted vegetation		
	Permanent / Perennial	Seasonal / Intermittent	Temporary / Ephemeral
≥ 65%	1H	.9H	.7M
35-64%	.7M	.6M	.5M
< 35%	.3L	.2L	.1L

Comments:

14I. Production Export/Food Chain Support:

i. Level of Biological Activity (synthesis of wildlife and fish habitat ratings [circle])

General Fish Habitat Rating (14D.iii.)	General Wildlife Habitat Rating (14C.iii.)		
	E/H	M	L
E/H	H	H	M
M	H	M	M
L	M	M	L
N/A	H	M	L

ii. Rating (Working from top to bottom, use the matrix below to arrive at [circle] the functional points and rating. Factor A = acreage of vegetated wetland component in the AA; Factor B = level of biological activity rating from above (14I.i.); Factor C = whether or not the AA contains a surface or subsurface outlet; the final three rows pertain to duration of surface water in the AA, where P/P, S/I, and T/E are as previously defined, and A = "absent" [see instructions for further definitions of these terms].)

A	Vegetated component >5 acres						Vegetated component 1-5 acres						Vegetated component <1 acre					
	High		Moderate		Low		High		Moderate		Low		High		Moderate		Low	
B	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No
C	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No
P/P	1H	.7M	.8H	.5M	.6M	.4M	.9H	.6M	.7M	.4M	.5M	.3L	.8H	.6M	.6M	.4M	.3L	.2L
S/I	.9H	.6M	.7M	.4M	.5M	.3L	.8H	.5M	.6M	.3L	.4M	.2L	.7M	.5M	.5M	.3L	.3L	.2L
T/E/A	.8H	.5M	.6M	.3L	.4M	.2L	.7M	.4M	.5M	.2L	.3L	.1L	.6M	.4M	.4M	.2L	.2L	.1L

iii. Modified Rating (NOTE: Modified score cannot exceed 1 or be less than 0.1.) **Vegetated Upland Buffer (VUB):** Area with ≥ 30% plant cover, ≤ 15% noxious weed or ANVS cover, and that is not subjected to periodic mechanical mowing or clearing (unless for weed control).

a) Is there an average ≥ 50 foot-wide vegetated upland buffer around ≥ 75% of the AA circumference? **Y N** If yes, add 0.1 to the score in ii above and adjust rating accordingly: _____

iv. Final Score and Rating: _____ **Comments:** _____

14J. Groundwater Discharge/Recharge: (check the appropriate indicators in i & ii below)

i. Discharge Indicators

- ☒ The AA is a slope wetland
- ☒ Springs or seeps are known or observed
- ☒ Vegetation growing during dormant season/drought
- ☒ Wetland occurs at the toe of a natural slope
- ☒ Seeps are present at the wetland edge
- ☐ AA permanently flooded during drought periods
- ☐ Wetland contains an outlet, but no inlet
- ☒ Shallow water table and the site is saturated to the surface
- ☐ Other: _____

ii. Recharge Indicators

- ☐ Permeable substrate present without underlying impeding layer
- ☐ Wetland contains inlet but no outlet
- ☐ Stream is a known 'losing' stream; discharge volume decreases
- ☐ Other: _____

Criteria		Duration of saturation at AA Wetlands <u>FROM GROUNDWATER DISCHARGE OR WITH WATER THAT IS RECHARGING THE GROUNDWATER SYSTEM</u>			
	P/P	S/I	T	None	
Groundwater Discharge or Recharge	1H	7M	4M	1L	
Insufficient Data/Information	N/A				

14K. Uniqueness:

Rating (working from top to bottom, use the matrix below to arrive at grade)				AA does not contain previously cited rare types and structural diversity (#13) is high or contains plant association listed as "S2" by the MTNHP			AA does not contain previously cited rare types or associations and structural diversity (#13) is low-moderate		
Replacement potential	AA contains fen, bog, warm springs or mature (>80 yr-old) forested wetland or plant association listed as "S1" by the MTNHP			AA does not contain previously cited rare types and structural diversity (#13) is high or contains plant association listed as "S2" by the MTNHP			AA does not contain previously cited rare types or associations and structural diversity (#13) is low-moderate		
Estimated relative abundance (#11)	rare	common	abundant	rare	common	abundant	rare	common	abundant
Low disturbance at AA (#12)	1H	.9H	.8H	.8H	6M	5M	.5M	4M	3L
Moderate disturbance at AA (#12)	.9H	.8H	.7M	.7M	5M	4M	4M	3L	2L
High disturbance at AA (#12)	.8H	.7M	6M	6M	4M	3L	3L	2L	1L

Comments:

I. Is the AA a known or potential rec./ed. site: (circle) Y N (if 'Yes' continue with the evaluation; if 'No' then circle **NA** here and proceed to the overall summary and rating page)

iii. Rating (use the matrix below to arrive at [circle] the functional points and rating)

Known or Potential Recreation or Education Area	Known	Potential
Public ownership or public easement with general public access (no permission required)	.2H	.15H
Private ownership with general public access (no permission required)	.15H	.1M
Private or public ownership without general public access, or requiring permission for public access	.1M	.05L

Comments:

General Site Notes Site is a spring-fed wetland with a small E-shaped channel that develops further down spring, source:

FUNCTION & VALUE SUMMARY & OVERALL RATING FOR WETLAND/SITE #(S): McRae 02

Function & Value Variables	Rating	Actual Functional Points	Possible Functional Points	Functional Units: (Actual Points x Estimated AA Acreage)	Indicate the four most prominent functions with an asterisk (*)
A. Listed/Proposed T&E Species Habitat	L	0	1		
B. MT Natural Heritage Program Species Habitat	M	0.5	1		
C. General Wildlife Habitat	M	0.5	1		
D. General Fish Habitat	NA				
E. Flood Attenuation	M	0.5	1		
F. Short and Long Term Surface Water Storage	H	0.9	1		
G. Sediment/Nutrient/Toxicant Removal	H	0.9	1		
H. Sediment/Shoreline Stabilization	NA				
I. Production Export/Food Chain Support	M	0.7	1		
J. Groundwater Discharge/Recharge	M	0.7	1		
K. Uniqueness	L	0.3	1		
L. Recreation/Education Potential (bonus points)			NA		
Totals:		5	9		
Percent of Possible Score			55.6%		

Category I Wetland: (must satisfy **one** of the following criteria; otherwise go to Category II)

- ___ Score of 1 functional point for Listed/Proposed Threatened or Endangered Species; **or**
- ___ Score of 1 functional point for Uniqueness; **or**
- ___ Score of 1 functional point for Flood Attenuation **and** answer to Question 14E.ii is "yes"; **or**
- ___ Percent of possible score > 80% (round to nearest whole #).

Category II Wetland: (Criteria for Category I not satisfied **and** meets any **one** of the following criteria; otherwise go to Category IV)

- ___ Score of 1 functional point for MT Natural Heritage Program Species Habitat; **or**
- ___ Score of .9 or 1 functional point for General Wildlife Habitat; **or**
- ___ Score of .9 or 1 functional point for General Fish Habitat; **or**
- ___ "High" to "Exceptional" ratings for **both** General Wildlife Habitat **and** General Fish/Aquatic Habitat; **or**
- ___ Score of .9 functional point for Uniqueness; **or**
- ___ Percent of possible score > 65% (round to nearest whole #).

Category III Wetland: (Criteria for Categories I, II, or IV not satisfied)

Category IV Wetland: (Criteria for Categories I or II are not satisfied and all of the following criteria are met; otherwise go to Category III)

- ___ "Low" rating for Uniqueness; **and**
- ___ Vegetated wetland component < 1 acre (do not include upland vegetated buffer); **and**
- ___ Percent of possible score < 35% (round to nearest whole #).

OVERALL ANALYSIS AREA RATING: (circle appropriate category based on the criteria outlined above) I II III IV

MDT Montana Wetland Assessment Form (revised March 2008)

1. Project Name: Tungsten River Palmet - Coldstrip 2. MDT Project #: _____ Control #: _____
 3. Evaluation Date: Mo. _____ Day _____ Yr. _____ 4. Evaluator(s): _____ 5. Wetlands/Site #(s): Wells
 6. Wetland Location(s): I. Legal: T _____ N or S; R _____ E or W; S _____; T _____ N or S; R _____ E or W; S _____;
 II. Approx. Stationing or Mileposts: _____
 III. Watershed: _____ Watershed Name, County: _____

7. a. Evaluating Agency: _____ 8. Wetland size: (total acres) 1.03 (visually estimated)
 b. Purpose of Evaluation: _____ (measured, e.g. by GPS [if applies])
 1. _____ Wetlands potentially affected by MDT project
 2. _____ Mitigation wetlands; pre-construction
 3. _____ Mitigation wetlands; post-construction
 4. ☒ Other Tungsten River Palmet 616 ft x 30 ft
 9. Assessment area (AA): (acres, 0.43 (visually estimated)
 see instructions on determining AA) _____ (measured, e.g. by GPS [if applies])

10. Classification of Wetland and Aquatic Habitats in AA

HGM Class (Brinson)	Class (Cowardin)	Modifier (Cowardin)	Water Regime	% of AA
D	EM		A	25
D	SS		A	75

Abbreviations: (see manual for definitions)

HGM Classes: Riverine (R), Depressional (D), Slope (S), Mineral Soil Flats (MSF), Organic Soil Flats (OSF), Lacustrine Fringe (LF);

Cowardin Classes: Rock Bottom (RB), Unconsolidated bottom (UB), Aquatic Bed (AB), Unconsolidated Shore (US), Moss-lichen Wetland (ML), Emergent Wetland (EM), Scrub-Shrub Wetland (SS), Forested Wetland (FO)

Modifiers: Excavated (E), Impounded (I), Diked (D), Partly Drained (PD), Farmed (F), Artificial (A)

Water Regimes: Permanent / Perennial (PP), Seasonal / Intermittent (SI), Temporary / Ephemeral (TE)

11. Estimated relative abundance: (of similarly classified sites within the same Major Montana Watershed Basin, see definitions)

(Circle one) Unknown Rare Common Abundant

12. General condition of AA:

i. Disturbance: (use matrix below to determine [circle] appropriate response – see instructions for Montana-listed noxious weed and aquatic nuisance vegetation species (ANVS) lists)

Conditions within AA	Predominant conditions adjacent to (within 500 feet of) AA		
	Managed in predominantly natural state, is not grazed, hayed, logged, or otherwise converted; does not contain roads or buildings; and noxious weed or ANVS cover is ≤15%	Land not cultivated, but may be moderately grazed or hayed or selectively logged, or has been subject to minor clearing; contains few roads or buildings; noxious weed or ANVS cover is ≤30%	Land cultivated or heavily grazed or logged; subject to substantial fill placement, grading, clearing, or hydrological alteration; high road or building density; or noxious weed or ANVS cover is >30%
AA occurs and is managed in predominantly natural state; is not grazed, hayed, logged, or otherwise converted; does not contain roads or occupied buildings; and noxious weed or ANVS cover is ≤15%	low disturbance	low disturbance	moderate disturbance
AA not cultivated, but may be moderately grazed or hayed or selectively logged; or has been subject to relatively minor clearing, fill placement, or hydrological alteration; contains few roads or buildings; noxious weed or ANVS cover is ≤30%	moderate disturbance	moderate disturbance	high disturbance
AA cultivated or heavily grazed or logged; subject to relatively substantial fill placement, grading, clearing, or hydrological alteration; high road or building density; or noxious weed or ANVS cover is >30%	high disturbance	high disturbance	high disturbance

Comments: (types of disturbance, intensity, season, etc.): have paddock near agricultural field, grass further out

ii. Prominent noxious, aquatic nuisance, & other exotic vegetation species: Cirsium americanum, Phytolacca americana, Bromus inermis

iii. Provide brief descriptive summary of AA and surrounding land use/habitat: immediately adjacent land is used for agriculture then further out for live stock grazing. road & bridge

13. Structural Diversity: (based on number of "Cowardin" vegetated classes present [do not include unvegetated classes], see #10 above)

Existing # of "Cowardin" Vegetated Classes in AA	Initial Rating	Is current management preventing (passive) existence of additional vegetated classes?		Modified Rating
≥3 (or 2 if 1 is forested) classes	H	NA	NA	NA
2 (or 1 if forested) classes	M	NA	NA	NA
1 class, but not a monoculture	M	NO	YES	L
1 class, monoculture (1 species comprises ≥90% of total cover)	L	NA	NA	NA

Comments:

SECTION PERTAINING to FUNCTIONS & VALUES ASSESSMENT

14A. Habitat for Federally Listed or Proposed Threatened or Endangered Plants or Animals:

i. AA is Documented (D) or Suspected (S) to contain (circle one based on definitions contained in instructions):

Primary or critical habitat (list species) D S _____
 Secondary habitat (list species) D S _____
 Incidental habitat (list species) D S _____
 No usable habitat S

ii. **Rating** (use the conclusions from i above and the matrix below to arrive at [circle] the functional points and rating)

Highest Habitat Level	doc/primary	sus/primary	doc/secondary	sus/secondary	doc/incidental	sus/incidental	None
Functional Points and Rating	1H	.9H	.8M	.7M	.3L	.1L	0L

Sources for documented use (e.g. observations, records, etc):

14B. Habitat for plant or animals rated S1, S2, or S3 by the Montana Natural Heritage Program: (not including species listed in 14A above)

i. AA is Documented (D) or Suspected (S) to contain (circle one based on definitions contained in instructions):

Primary or critical habitat (list species) D S _____
 Secondary habitat (list species) D S green grassland, plains, sparsely forested
 Incidental habitat (list species) D S _____
 No usable habitat S

ii. **Rating** (use the conclusions from i above and the matrix below to arrive at [circle] the functional points and rating)

Highest Habitat Level	doc/primary	sus/primary	doc/secondary	sus/secondary	doc/incidental	sus/incidental	None
S1 Species:							
Functional Points and Rating	1H	.8H	.7M	.6M	.2L	.1L	0L
S2 and S3 Species:							
Functional Points and Rating	.9H	.7M	.6M	.5M	.2L	.1L	0L

Sources for documented use (e.g. observations, records, etc):

14C. General Wildlife Habitat Rating:

i. Evidence of overall wildlife use in the AA (circle substantial, moderate, or low based on supporting evidence):

Substantial (based on any of the following [check]):

- ☐ observations of abundant wildlife #s or high species diversity (during any period)
- ☐ abundant wildlife sign such as scat, tracks, nest structures, game trails, etc.
- ☐ presence of extremely limiting habitat features not available in the surrounding area
- ☐ interviews with local biologists with knowledge of the AA

Minimal (based on any of the following [check]):

- ☐ few or no wildlife observations during peak use periods
- ☒ little to no wildlife sign
- ☐ sparse adjacent upland food sources
- ☐ interviews with local biologists with knowledge of the AA

Moderate (based on any of the following [check]):

- ☐ observations of scattered wildlife groups or individuals or relatively few species during peak periods
- ☐ common occurrence of wildlife sign such as scat, tracks, nest structures, game trails, etc.
- ☐ adequate adjacent upland food sources
- ☐ interviews with local biologists with knowledge of the AA

ii. **Wildlife habitat features** (Working from top to bottom, circle appropriate AA attributes in matrix to arrive at rating. Structural diversity is from #13.

For class cover to be considered evenly distributed, the most and least prevalent **vegetated** classes must be within 20% of each other in terms of their percent composition of the AA (see #10). Abbreviations for surface water durations are as follows: P/P = permanent/perennial; S/I = seasonal/intermittent; T/E = temporary/ephemeral; and A = absent (see instructions for further definitions of these terms)

Structural diversity (see #13)	High								Moderate								Low							
	Even				Uneven				Even				Uneven				Even							
Class cover distribution (all vegetated classes)	P/P	S/I	T/E	A	P/P	S/I	T/E	A	P/P	S/I	T/E	A	P/P	S/I	T/E	A	P/P	S/I	T/E	A	P/P	S/I	T/E	A
Duration of surface water in ≥ 10% of AA																								
Low disturbance at AA (see #12i)	E	E	E	H	E	E	H	H	E	H	H	M	E	H	M	M	E	H	M	L	E	H	M	M
Moderate disturbance at AA (see #12i)	H	H	H	H	H	H	H	M	H	H	M	M	H	M	M	L	H	M	L	L	H	M	L	L
High disturbance at AA (see #12i)	M	M	M	L	M	M	L	L	M	M	L	L	M	L	L	L	M	L	L	L	M	L	L	L

iii. **Rating** (use the conclusions from i and ii above and the matrix below to arrive at [circle] the functional points and rating)

Evidence of wildlife use (i)	Wildlife habitat features rating (ii)			
	Exceptional	High	Moderate	Low
Substantial	1E	.9H	.8H	.7M
Moderate	.9H	.7M	.5M	.3L
Minimal	.6M	.4M	.2L	.1L

Comments:

14D. General Fish Habitat Rating: (Assess this function if the AA is used by fish or the existing situation is "correctable" such that the AA could be used by fish [i.e., fish use is precluded by perched culvert or other barrier, etc.]. If the AA is not used by fish, fish use is not restorable due to habitat constraints, or is not desired from a management perspective [such as fish entrapped in a canal], then circle **NA** here and proceed to 14E.)

Type of Fishery: Cold Water (CW)___ Warm Water (WW)___ Use the CW or WW guidelines in the user manual to complete the matrix

I. Habitat Quality and Known / Suspected Fish Species in AA (use matrix to arrive at [circle] the functional points and rating)

Duration of surface water in AA	Permanent / Perennial						Seasonal / Intermittent						Temporary / Ephemeral					
	Optimal		Adequate		Poor		Optimal		Adequate		Poor		Optimal		Adequate		Poor	
Aquatic hiding / resting / escape cover	O	S	O	S	O	S	O	S	O	S	O	S	O	S	O	S	O	S
Thermal cover optimal / suboptimal	O	S	O	S	O	S	O	S	O	S	O	S	O	S	O	S	O	S
FWP Tier I fish species	1E	.9H	.8H	.7M	.6M	.5M	.9H	.8H	.7M	.6M	.5M	.4M	.7M	.6M	.5M	.4M	.3L	.2L
FWP Tier II or Native Game fish species	.9H	.8H	.7M	.6M	.5M	.5M	.8H	.7M	.6M	.5M	.4M	.4M	.6M	.5M	.4M	.3L	.2L	.2L
FWP Tier III or Introduced Game fish	.8H	.7M	.6M	.5M	.5M	.4M	.7M	.6M	.5M	.4M	.4M	.3L	.5M	.4M	.3L	.2L	.2L	.1L
FWP Non-Game Tier IV or No fish species	.5M	.5M	.5M	.4M	.4M	.3L	.4M	.4M	.4M	.3L	.3L	.2L	.2L	.2L	.2L	.1L	.1L	.1L

Sources used for identifying fish sp. potentially found in AA:

ii. **Modified Rating** (NOTE: Modified score cannot exceed 1 or be less than 0.1)

a) Is fish use of the AA significantly reduced by a culvert, dike, or other man-made structure or activity or is the waterbody included on the current final MDEQ list of waterbodies in need of TMDL development with listed "Probable Impaired Uses" including cold or warm water fishery or aquatic life support, or do aquatic nuisance plant or animal species (see Appendix E) occur in fish habitat? Y N If yes, reduce score in I above by 0.1: _____

b) Does the AA contain a documented spawning area or other critical habitat feature (i.e., sanctuary pool, upwelling area, etc.- specify in comments) for native fish or introduced game fish? Y N If yes, add 0.1 to the adjusted score in I or Iia above: _____

III. Final Score and Rating: _____ **Comments:** _____

14E. Flood Attenuation: (Applies only to wetlands subject to flooding via in-channel or overbank flow. If wetlands in AA are not flooded from in-channel or overbank flow, circle **NA** here and proceed to 14F.) *oxbow no outlet except in exceptionally high flows*

I. Rating (working from top to bottom, use the matrix below to arrive at [circle] the functional points and rating)

Estimated or Calculated Entrenchment (Rosgen 1994, 1996)	Slightly entrenched - C, D, E stream types			Moderately entrenched - B stream type			Entrenched-A, F, G stream types		
	75%	25-75%	<25%	75%	25-75%	<25%	75%	25-75%	<25%
AA contains no outlet or restricted outlet	1H	.9H	.6M	.8H	.7M	.5M	.4M	.3L	.2L
AA contains unrestricted outlet	.9H	.8H	.5M	.7M	.6M	.4M	.3L	.2L	.1L

Entrenchment ratio (ER) estimation – see User's Manual for additional guidance. Entrenchment ratio = (flood-prone width)/(bankfull width)

Flood-prone width = estimated horizontal projection of where 2 x maximum bankfull depth elevation intersects the floodplain on each side of the stream.



Slightly Entrenched ER = >2.2			Moderately Entrenched ER = 1.41 – 2.2		Entrenched ER = 1.0 – 1.4		
C stream type	D stream type	E stream type	B stream type		A stream type	F stream type	G stream type

II. Are ≥10 acres of wetland in the AA subject to flooding AND are man-made features which may be significantly damaged by floods located within 0.5 mile downstream of the AA (circle)? Y **(N)** **Comments:** _____

14F. Short and Long Term Surface Water Storage: (Applies to wetlands that flood or pond from overbank or in-channel flow, precipitation, upland surface flow, or groundwater flow. If no wetlands in the AA are subject to flooding or ponding, circle **NA** here and proceed to 14G.)

I. Rating (Working from top to bottom, use the matrix below to arrive at [circle] the functional points and rating. Abbreviations for surface water durations are as follows: P/P = permanent/perennial; S/I = seasonal/intermittent; and T/E = temporary/ephemeral [see instructions for further definitions of these terms].)

Estimated maximum acre feet of water contained in wetlands within the AA that are subject to periodic flooding or ponding	>5 acre feet			1.1 to 5 acre feet			≤1 acre foot		
	P/P	S/I	T/E	P/P	S/I	T/E	P/P	S/I	T/E
Duration of surface water at wetlands within the AA									
Wetlands in AA flood or pond ≥ 5 out of 10 years	1H	.9H	.8H	.8H	.6M	.5M	.4M	.3L	.2L
Wetlands in AA flood or pond < 5 out of 10 years	.9H	.8H	.7M	.7M	.5M	.4M	.3L	.2L	.1L

Comments: _____

14G. Sediment/Nutrient/Toxicant Retention and Removal: (Applies to wetlands with potential to receive sediments, nutrients, or toxicants through influx of surface or ground water or direct input. If no wetlands in the AA are subject to such input, circle **NA** here and proceed to 14H.)

i. **Rating** (working from top to bottom, use the matrix below to arrive at [circle] the functional points and rating [H = high, M = moderate, or L = low])

Sediment, nutrient, and toxicant input levels within AA	AA receives or surrounding land use with potential to deliver levels of sediments, nutrients, or compounds at levels such that other functions are not substantially impaired. Minor sedimentation, sources of nutrients or toxicants, or signs of eutrophication present.				Waterbody on MDEQ list of waterbodies in need of TMDL development for "probable causes" related to sediment, nutrients, or toxicants or AA receives or surrounding land use with potential to deliver high levels of sediments, nutrients, or compounds such that other functions are substantially impaired. Major sedimentation, sources of nutrients or toxicants, or signs of eutrophication present.			
	≥ 70%		< 70%		≥ 70%		< 70%	
% cover of wetland vegetation in AA	Yes	No	Yes	No	Yes	No	Yes	No
Evidence of flooding / ponding in AA	1H	.8H	.7M	.5M	.5M	.4M	.3L	.2L
AA contains no or restricted outlet	.9H	.7M	.6M	.4M	.4M	.3L	.2L	.1L
AA contains unrestricted outlet								

Comments:

14H Sediment/Shoreline Stabilization: (Applies only if AA occurs on or within the banks of a river, stream, or other natural or man-made drainage, or on the shoreline of a standing water body which is subject to wave action. If 14H does not apply, circle **NA** here and proceed to 14I.)

i. **Rating** (working from top to bottom, use the matrix below to arrive at [circle] the functional points and rating)

% Cover of wetland streambank or shoreline by species with stability ratings of ≥ 6 (see Appendix F).	Duration of surface water adjacent to rooted vegetation		
	Permanent / Perennial	Seasonal / Intermittent	Temporary / Ephemeral
≥ 65%	1H	.9H	.7M
35-64%	.7M	.6M	.5M
< 35%	.3L	.2L	.1L

Comments:

14I. Production Export/Food Chain Support:

i. **Level of Biological Activity** (synthesis of wildlife and fish habitat ratings [circle])

General Fish Habitat Rating (14D.iii.)	General Wildlife Habitat Rating (14C.iii.)		
	E/H	M	L
E/H	H	H	M
M	H	M	M
L	M	M	L
NA	H	M	L

ii. **Rating** (Working from top to bottom, use the matrix below to arrive at [circle] the functional points and rating. Factor A = acreage of vegetated wetland component in the AA; Factor B = level of biological activity rating from above (14I.i.); Factor C = whether or not the AA contains a surface or subsurface outlet; the final three rows pertain to duration of surface water in the AA, where P/P, S/I, and T/E are as previously defined, and A = "absent" [see instructions for further definitions of these terms].)

A	Vegetated component > 5 acres						Vegetated component 1-5 acres						Vegetated component < 1 acre					
	High		Moderate		Low		High		Moderate		Low		High		Moderate		Low	
B	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No
C	1H	.7M	.8H	.5M	.6M	.4M	.9H	.6M	.7M	.4M	.5M	.3L	.8H	.6M	.6M	.4M	.3L	.2L
P/P	.9H	.6M	.7M	.4M	.5M	.3L	.8H	.5M	.6M	.3L	.4M	.2L	.7M	.5M	.5M	.3L	.3L	.2L
S/I	.8H	.5M	.6M	.3L	.4M	.2L	.7M	.4M	.5M	.2L	.3L	.1L	.6M	.4M	.4M	.2L	.2L	.1L
T/E/A																		

iii. **Modified Rating** (NOTE: Modified score cannot exceed 1 or be less than 0.1.) **Vegetated Upland Buffer (VUB):** Area with ≥ 30% plant cover, ≤ 15% noxious weed or ANVS cover, and that is not subjected to periodic mechanical mowing or clearing (unless for weed control).

a) Is there an average ≥ 50 foot-wide vegetated upland buffer around ≥ 75% of the AA circumference? Y **N** If yes, add 0.1 to the score in ii above and adjust rating accordingly:

iv. **Final Score and Rating:** 0.2L **Comments:**

14J. Groundwater Discharge/Recharge: (check the appropriate indicators in i & ii below) **NA**

i. **Discharge Indicators**

- ☐ The AA is a slope wetland
- ☐ Springs or seeps are known or observed
- ☐ Vegetation growing during dormant season/drought
- ☐ Wetland occurs at the toe of a natural slope
- ☐ Seeps are present at the wetland edge
- ☐ AA permanently flooded during drought periods
- ☐ Wetland contains an outlet, but no inlet
- ☐ Shallow water table and the site is saturated to the surface
- ☐ Other:

ii. **Recharge Indicators**

- ☐ Permeable substrate present without underlying impeding layer
- ☐ Wetland contains inlet but no outlet
- ☐ Stream is a known 'losing' stream; discharge volume decreases
- ☐ Other:

Duration of saturation at AA Wetlands <u>FROM GROUNDWATER DISCHARGE OR WITH WATER THAT IS RECHARGING THE GROUNDWATER SYSTEM</u>				
Criteria	P/P	S/I	T	None
Groundwater Discharge or Recharge	1H	.7M	.4M	.1L
Insufficient Data/Information	N/A			
Comments:				

i. **Rating** (working from top to bottom, use the matrix below to arrive at [circle] the functional points and rating)

Replacement potential				AA does not contain previously cited rare types and structural diversity (#13) is high or contains plant association listed as "S2" by the MTNHP			AA does not contain previously cited rare types or associations and structural diversity (#13) is low-moderate		
Estimated relative abundance (#11)	rare	common	abundant	rare	common	abundant	rare	common	abundant
Low disturbance at AA (#12i)	1H	.9H	.8H	.8H	.6M	.5M	.5M	.4M	.3L
Moderate disturbance at AA (#12i)	.9H	.8H	.7M	.7M	.5M	.4M	.4M	.3L	.2L
High disturbance at AA (#12i)	.8H	.7M	.6M	.6M	.4M	.3L	.3L	.2L	.1L

14L. Recreation/Education Potential: (affords "bonus" points if AA provides recreation or education opportunity)

II. Check categories that apply to the AA: Educational/scientific study; ___ Consumptive rec.; ___ Non-consumptive rec.; ___ Other

Known or Potential Recreation or Education Area	Known	Potential
Public ownership or public easement with general public access (no permission required)	.2H	.15H
Private ownership with general public access (no permission required)	.15H	.1M
Private or public ownership without general public access, or requiring permission for public access	.1M	.05L

General Site Notes Wetland is found in old cutbox of Fresh Creek. It is relatively "far" from proposed Tongue River Railroad line, but was chosen because it is fairly representative of vegetation seen in many of the riparian areas. Both larger banks of vegetation are where the stream is not disconnected from the floodplain by steep banks. Banks in area of assessment were 1-2 ft higher than current water level and relatively gentle with regards to slope. Proposed rail line is approx 40 ft to the west or southwest to the southwest of assessment area. Because it is an outlier it is not ideal representation of all riparian areas in similarly vegetated riparian areas in the region.

FUNCTION & VALUE SUMMARY & OVERALL RATING FOR WETLAND/SITE #(S): Wells

Function & Value Variables	Rating	Actual Functional Points	Possible Functional Points	Functional Units: (Actual Points x Estimated AA Acreage)	Indicate the four most prominent functions with an asterisk (*)
A. Listed/Proposed T&E Species Habitat	L	0	1		
B. MT Natural Heritage Program Species Habitat	M	0.5	1		
C. General Wildlife Habitat	L	0.1	1		
D. General Fish Habitat	NA				
E. Flood Attenuation	M	0.5	1		
F. Short and Long Term Surface Water Storage	M	0.7	1		
G. Sediment/Nutrient/Toxicant Removal	H	0.8	1		
H. Sediment/Shoreline Stabilization	NA				
I. Production Export/Food Chain Support	L	0.2	1		
J. Groundwater Discharge/Recharge	NA				
K. Uniqueness	L	0.2	1		
L. Recreation/Education Potential (bonus points)			NA		
Totals:		3.0	8		
Percent of Possible Score			37.5 %		

Category I Wetland: (must satisfy **one** of the following criteria; otherwise go to Category II)

- ___ Score of 1 functional point for Listed/Proposed Threatened or Endangered Species; **or**
- ___ Score of 1 functional point for Uniqueness; **or**
- ___ Score of 1 functional point for Flood Attenuation **and** answer to Question 14E.ii is "yes"; **or**
- ___ Percent of possible score > 80% (round to nearest whole #).

Category II Wetland: (Criteria for Category I not satisfied **and** meets any **one** of the following criteria; otherwise go to Category IV)

- ___ Score of 1 functional point for MT Natural Heritage Program Species Habitat; **or**
- ___ Score of .9 or 1 functional point for General Wildlife Habitat; **or**
- ___ Score of .9 or 1 functional point for General Fish Habitat; **or**
- ___ "High" to "Exceptional" ratings for **both** General Wildlife Habitat **and** General Fish/Aquatic Habitat; **or**
- ___ Score of .9 functional point for Uniqueness; **or**
- ___ Percent of possible score > 65% (round to nearest whole #).

Category III Wetland: (Criteria for Categories I, II, or IV not satisfied)

Category IV Wetland: (Criteria for Categories I or II are not satisfied and all of the following criteria are met; otherwise go to Category III)

- ___ "Low" rating for Uniqueness; **and**
- ___ Vegetated wetland component < 1 acre (do not include upland vegetated buffer); **and**
- ___ Percent of possible score < 35% (round to nearest whole #).

OVERALL ANALYSIS AREA RATING: (circle appropriate category based on the criteria outlined above) I II III IV

FOREST MANAGEMENT PLAN
FOR THE
NORTHERN CHEYENNE RESERVATION
2009 THROUGH 2023

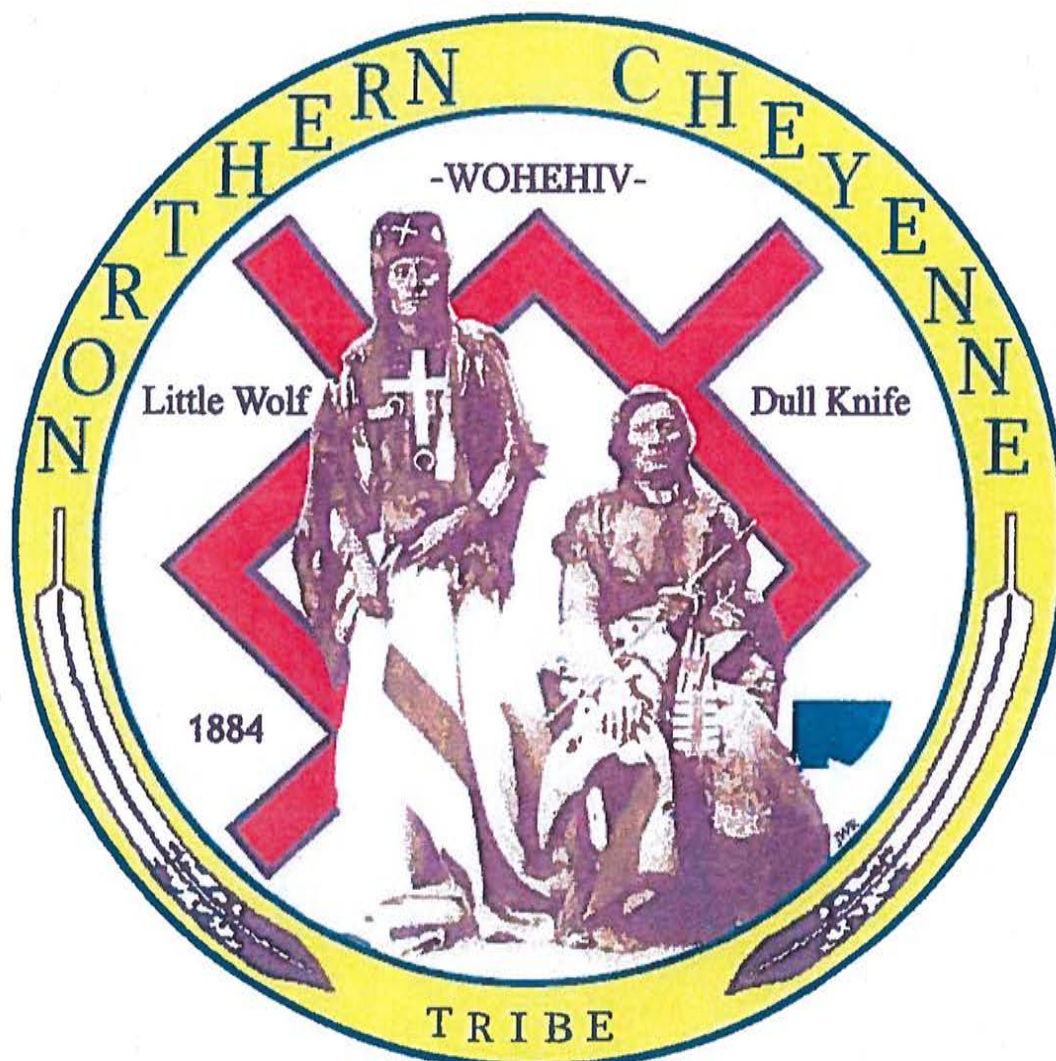
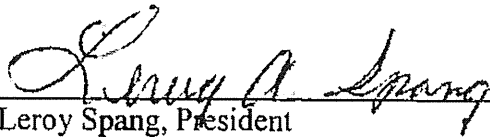


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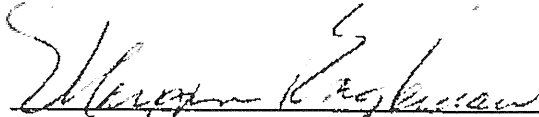
Version 8, 2-16-09

Prepared by Frank Desmond Rollefson

Recommended for Approval by:


Leroy Spang, President
Northern Cheyenne Tribe

2-16-09
Date

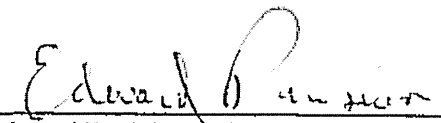

Marjorie Eagleman, Superintendent
Northern Cheyenne Agency

2-26-09
Date


Tom Corbin
Acting Regional Forester

2-26-09
Date

Approved by:


Edward Parisian, Director
Rocky Mountain Region

2-26-09
Date

**TRIBAL COUNCIL OF THE NORTHERN CHEYENNE
NORTHERN CHEYENNE RESERVATION
LAME DEER, MONTANA**

RESOLUTION NO. DOI- 064 (2009)

**A RESOLUTION OF THE NORTHERN CHEYENNE TRIBAL COUNCIL
APPROVING THE NORTHERN CHEYENNE FOREST MANAGEMENT PLAN
FOR THE PERIOD 2009 THROUGH 2023.**

WHEREAS, the Northern Cheyenne Tribal Council is the governing body of the Northern Cheyenne Reservation by authority of the Amended Constitution and Bylaws as approved by the Secretary of Interior on May 31, 1996; and,

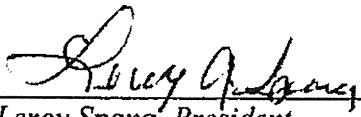
WHEREAS, prudent management of the forest resources on the Northern Cheyenne Reservation and formally establishing a direction for forest management is of vital importance to the Northern Cheyenne Tribe; and,

WHEREAS, the Bureau of Indian Affairs, as part of its trust responsibility to manage the Reservation forest resources, has prepared in conjunction with the Tribe, the attached Forest Management Plan to implement best management practices and policies for the Northern Cheyenne forest resources; now,

THEREFORE BE IT RESOLVED that the Northern Cheyenne Tribal Council hereby approves the attached Northern Cheyenne Forest Management Plan for the period 2009 through 2023 and authorizes the Tribal President to sign and execute the necessary documents on behalf of the Northern Cheyenne Tribe; and,

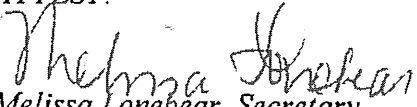
BE IT FURTHER RESOLVED that this resolution supersedes any and all previous resolutions regarding Forest Management Plans on behalf of the Northern Cheyenne Tribe.

PASSED ADOPTED AND APPROVED by the Northern Cheyenne Tribal council by 10 votes for passage and adoption and 0 against passage and adoption this 16th day of February, 2009.



Leroy Spang, President
Northern Cheyenne Tribal Council

ATTEST:


Melissa Lonebear, Secretary
Northern Cheyenne Tribal Council

PREFACE

This Forest Management Plan (Plan) document is to provide the Bureau of Indian Affairs, Northern Cheyenne Agency and the Northern Cheyenne Tribe with guidance in the management of the Northern Cheyenne Reservation forested lands. This plan was developed to promote forest health and provide for community protection while enhancing aesthetic values, recreational use, wildlife habitat, rangelands and to provide income to the tribe and individual tribal members. This plan uses the latest Forest Inventory Analysis completed in December 2007. This plan allows for the harvest of 6.9 million board feet (MMBF) of timber per year. The plan period is for 15 years from 2009 to 2023 with a review period after the 15 year period and with annual reviews occurring throughout the plan period. This plan may be amended, if needed, by agreement between the Northern Cheyenne Tribe and the Director of the Rocky Mountain Region at any time during the plan period. There will be a cooperative tribal and agency regularly scheduled annual review of the Forest Management Plan every September 1st for the length of this fifteen year plan.

Planning is an ongoing process which must consider dynamic socio-economic conditions, new inventories, and change in resource management goals. For planning, knowledge of past actions and the realization that future conditions may not be the same as those of the past is essential. Management must be prepared to adjust or modify existing systems to provide appropriate, state of the art forest management services.

Information gathered from formal discussions with local agency and tribal staff members, a forestry questionnaire provided to adult tribal members, and research findings have been incorporated into this plan. This plan has incorporated an interdisciplinary team approach made up of Northern Cheyenne Tribal and Northern Cheyenne Agency specialists to address forest management challenges and concerns on the Northern Cheyenne Reservation.

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 has 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.

ACKNOWLEDGEMENTS

The preparation of the Northern Cheyenne Forest Management Plan involved the contribution of time and effort of many individuals. Major contributors include the following.

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CHAPTER 1. FOREST RESOURCE ANALYSIS

1.0 Reservation Location & Physical Description

The 444,735 acre Northern Cheyenne Reservation is situated in the open, rolling country of south-eastern Montana. Much of the reservation consists of dry, open rangeland, with smaller areas of irrigated farmland confined to bottomland. The local economy is largely agriculturally-based, although logging and tourism also contribute. In all, less than 35 percent of the land is forested. At its widest part, the reservation extends about 36 miles from east to west and 23 miles from north to south. The Tongue River forms the east border, and the neighboring Crow Reservation lands the west border. The largest town is Lame Deer, situated at the junction of U.S. Highway 212 and Montana State Highway 39. Both BIA and Tribal Administrative offices are headquartered in Lame Deer, Montana.

1.1 Topography

The main topographic feature of the reservation is the deeply dissected plateau which forms the broad divide between Rosebud Creek and the Tongue River. The plateau was formed by the natural uplift of bedded sandstones followed by stream dissection that created the intricate topography of the present day. Elevation ranges from 2,900 feet along the Tongue River near Ashland to 4,800 feet atop the Trail Creek Divide in the southwest corner of the Reservation. The plateau itself ranges from 4000 to 4400 feet in elevation, and drops off most abruptly along its east flank where steep canyon walls form prominent break lands.

In the far northwest corner of the reservation are the relatively inconspicuous Sarpy Mountains. These consist of a series of broad buttes, carved out by stream dissection of flat uplands, creating the present day pattern of low relief, irregular topography.

1.1.1 Climate

The semi-arid, continental climate of south-eastern Montana is characterized by cold, dry winters coupled with cool, wet springs followed by hot, dry summers. Annual temperatures range from -40 to 110 degrees Fahrenheit. Weather throughout the year is marked by severe temperature extremes. From December through March, invasions of sub-zero arctic air are sometimes followed by unseasonably warm, dry Chinook winds. During the summer months, severe thunder storms develop as sudden cold fronts push unstable warm air aloft. In addition, summer drought is not uncommon, and wildfire risk is often very high by mid-summer.

Annual precipitation varies with elevation, ranging from 14 inches at Lame Deer and Busby to more than 20 inches at the higher elevations. The wettest period extends from April through June. In an average year, approximately 70 percent of annual precipitation falls during the growing season (April through September). At higher elevations, more

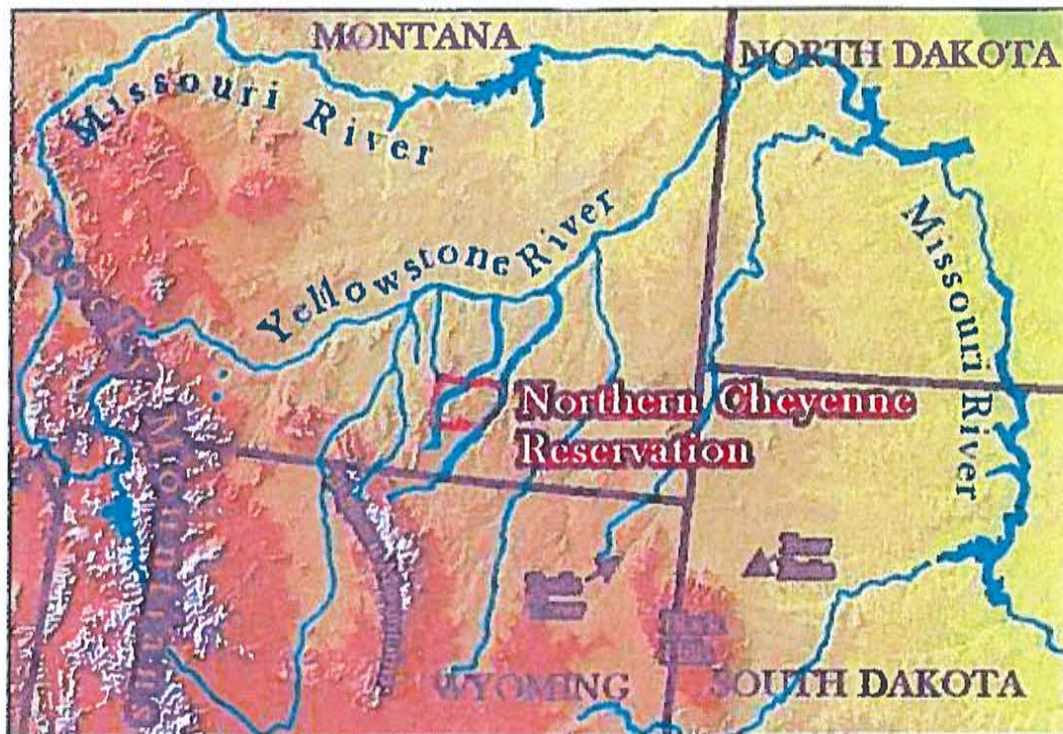


Figure 1. Northern Cheyenne Reservation location within the Yellowstone River Watershed in Southeastern Montana, map created by FDR, 1866 Clarke Projection.

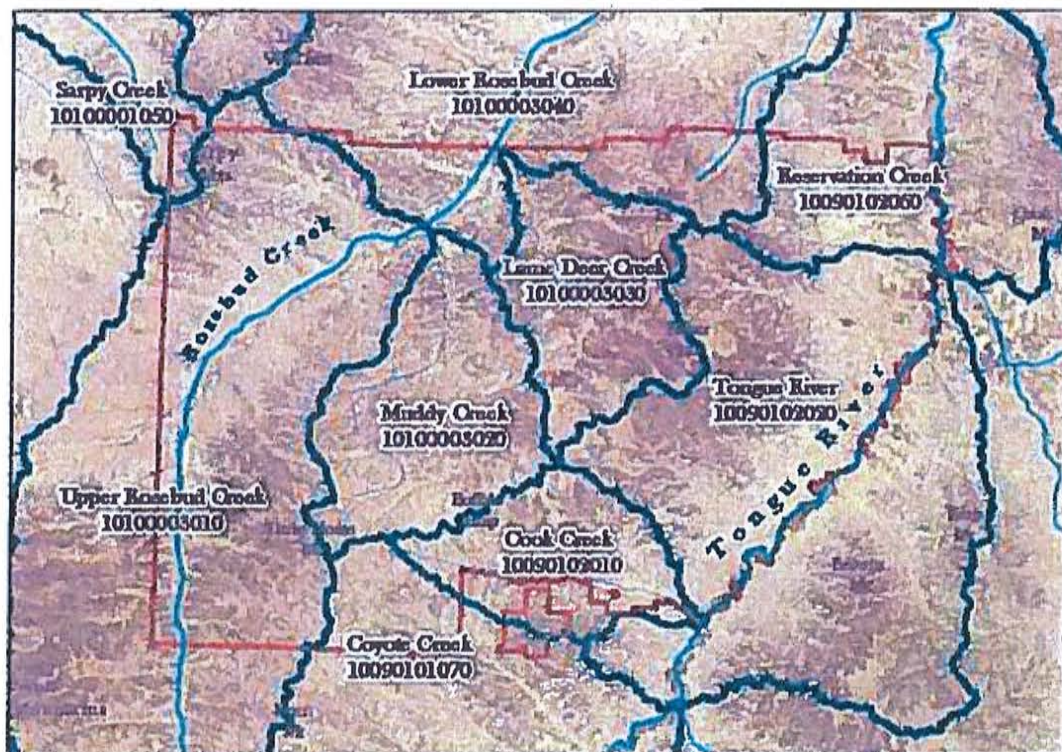


Figure 2. Sub-watersheds of the Reservation based upon USGS 11-digit Hydrologic Unit Code delineation of the United States Geologic Service, satellite image source Landsat 7 ETM+ 15 meter resolution, by FDR.

precipitation falls as snow with snow packs accumulating to 4 feet and more. The north and east-facing slopes are cooler and hold snow longer than the hotter, drier south- and west-facing slopes.

1.2 Resources

The Northern Cheyenne Reservation consists primarily of Rangeland and ponderosa pine as renewable resources. Based upon 1996 Landsat 5 Thematic Mapper satellite imagery purchased by the Northern Cheyenne Tribe from EROS Data Center in South Dakota and a Land Cover Classification conducted by the Geographic Data Service Center in LakeWood Colorado, the reservation consisted at this time of 193,211 acres of rangeland and 182,031 acres of ponderosa pine (Rollefson, 2003). This in addition to the Northern Cheyenne Water Rights Settlement Act of 1992 which ensures 20,000 annual acre feet of water in the Tongue River basin and 30,000 annual acre feet in the Yellowtail Dam makes the tribal renewable resources considerable.

In terms of non-renewable resources the coal reserves on Northern Cheyenne Reservation are vast being located in eastern portion of the Ft. Union Coal Formation. This untapped resource lays dormant, pending tribal governmental goals.

1.2.1 Timber

Three broad forest types are present on the Northern Cheyenne Reservation. The dominant forest type is comprised of pure ponderosa pine (*Pinus ponderosa*) stands which occur throughout the Reservation. Upland aspen (*Populus tremuloides*) stands are a minor component and not abundant enough to justify commercial exploitation, though these stands are important to Northern Cheyenne cultural practices. Riparian woodlands are the third forest type and are confined to areas along perennial and intermittent stream courses throughout the reservation.

The ponderosa pine stands growing on the reservation represent the arid edge of this species' range in Montana. Extreme temperatures, thin soils, and periodic drought together combine to limit tree growth. The forest is almost exclusively ponderosa pine yet there is a considerable amount of variety throughout, depending on moisture availability. Ponderosa pine forms dense stands on cool exposures and in steep draws and more open, irregular stands on dry benches and warm exposures. Along broad ridges and the upland plateau, the forest is intermingled with frequent grassland parks. The 155,066 acres of stocked and non-stocked ponderosa pine forestland contain a total volume of 279.6 million board-feet averaging 3,488 board-feet per acre on the 87,452 scheduled, managed forest acres (See Forest Inventory Analysis for the Northern Cheyenne Reservation Montana, December 2007).

Aspen stands are found throughout the reservation, primarily along stream courses and steep-walled draws. Stands are typically small, less than 30 acres in size. The condition of aspen stands has been expressed as an issue of concern by Northern Cheyenne Tribal members as the species is used in certain cultural and religious practices. The primary concern is the limited availability of aspen trees of a certain size. Many of the stands

found on the reservation are either young stands of sapling size or smaller or old stands of large trees that are in various stages of degradation. There is also often considerable in growth of ponderosa pine among the aspen that diminishes the amount of aspen available through shading.

Riparian stands are dominated by cottonwood (*Populus* spp.) trees, particularly in locations along perennial streams and rivers. Green ash (*Fraxinus pennsylvanica*) and box elder (*Acer negundo*) are less prominent in these stands. Understory species include choke cherry (*Prunus virginiana*), hawthorn (*Crataegus* spp.), and willow (*Salix* spp.). Composition of the understory in riparian stands plays a strong role in the quality and quantity of water within the stream. In many areas stream quality is degraded through grazing practices such that willow species are all but absent.

1.2.2 Range

Grazing represents the predominant land use, with approximately 90% of the land area of reservation suitable for this purpose. There are approximately 218,000 acres of rangeland, as well as another 200,000 acres of forested land, treated essentially as rangeland. There is an estimated grazing capacity of 82,000 Animal Units per Month (AUM). These are managed via 103 range units, varying in size from 108 to 24,000 acres. Grazing fee revenue is provided in Figure 1. Grazing occurs in open non-forested areas as well as commercial and non-commercial forest areas. Usually this consists of cow-calf pairing which turn out in April and May (calving season) and round up in October and November. Most animals stay on the reservation all year round.

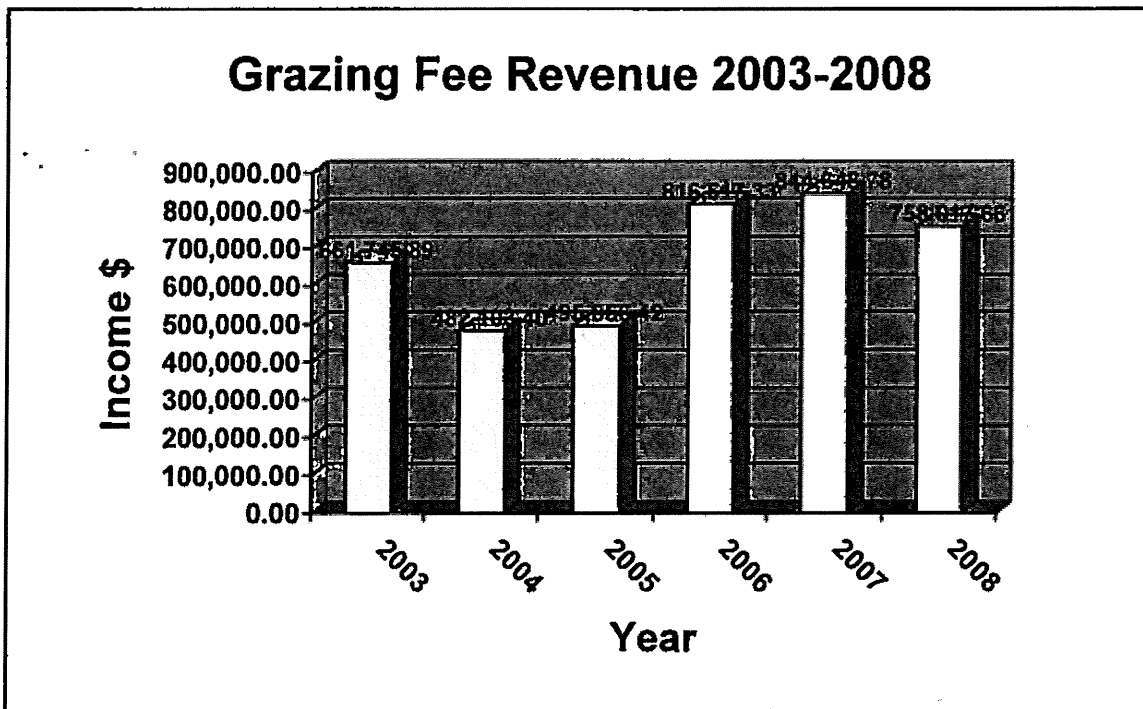


Figure 3. Northern Cheyenne Agency Grazing Fee Revenue from federally issued Grazing permits. Income reflects income to the Tribal General and Land Acquisition Funds from Tribal Tracts and does not include revenue generated from Allotted tracts.

Approximately 430,409 acres of the reservation are leased for range units, farming or home sites.

The utilization of lotic wetlands by cattle grazing has proven problematic in terms of creating poor riparian conditions. Non-point source pollution as a result of overgrazing of lotic wetland areas causes an increase in sediment transport in the stream, as well as destabilization of stream banks, and loss of vegetation within streamside corridors.

1.2.3 Wildlife

The reservation is home to a large variety of wildlife. Species common to the mountain ranges and prairie of south central Montana occur on the reservation. Mammal species include; mule deer (*Odocoileus hemionus*), white-tailed deer (*Odocoileus virginianus*), black bear (*Euarctos americanus*), elk (*Cervus canadensis*), coyote (*Canis latrans*), cougar (*Felis concolor*), bobcat (*Lynx rufus*), pronghorn antelope (*Antilocapra americana*), fox (*Vulpes* sp.), porcupine (*Erethizon dorsatum*), cottontail rabbit (*Sylvilagus* sp.) and black-tailed prairie dog (*Cynomys ludovicianus*). Numerous other small mammal species also occur on the reservation.

There are numerous species of resident and migratory birds found on the reservation. Game birds such as ruffed grouse (*Bonasa umbellus*), sharp-tailed grouse (*Pedioecetes phasianellus*), turkey (*Meleagris gallopavo*), and ring-necked pheasant (*Phasianus colchicus*) are present. Waterfowl species include: Canada geese (*Branta canadensis*), mallard (*Anas platyrhynchos*), redhead (*Aythya americana*), American widgeon (*Mareca americana*) and lesser scaup (*Aythya affinis*). There are many species of shorebirds present, such as herons, rails, and a variety of smaller species. There are many species of songbirds and woodpeckers throughout the reservation. A variety of raptors are commonly seen, such as golden eagles (*Aquila chrysaetos*), bald eagles (*Haliaeetus leucocephalus*), goshawk (*Accipiter gentilis*), kestrel (*Falco americana*), red-tailed hawk (*Buteo jamaicensis*), Northern harrier (*Circus cyaneus*), ferruginous hawk (*Buteo ragalis*), great gray owl (*Strix nebulosa*), great horned owl (*Bubo virginianus*) and screech owl (*Otus asia*).

The Northern Cheyenne Tribe has adopted a Fish and Game Code of 1996, which strictly prohibits non-member big game hunting on the Northern Cheyenne Reservation. This was followed by Fish and Hunting Regulations established and adopted by the tribal council in 2003.

1.2.4 Hydrology

The following information is from *The Northern Cheyenne Tribe and its Reservation*, a report to the Bureau of Land Management and the State of Montana Department of Natural Resources and Conservation, prepared by the Northern Cheyenne Tribe, April 2002. The report can be found in its entirety at:

The Tongue River and Rosebud Creek watersheds are the two principal drainages associated with the Northern Cheyenne Reservation. A small portion of the Sarpy Creek

drainage area is present on the northwest corner of the reservation. There are many small tributaries to the Tongue River and Rosebud Creek. Some of Tongue River tributaries contribute flow upstream of the reservation and along the reservation's eastern boundary. Second order tributaries tend to exhibit flow-gaining reaches in the headwaters of their drainages, which diminish with decreasing elevation. This is a function of higher precipitation and groundwater input occurring at higher elevations. Many of tributaries of the Tongue River and Rosebud Creek are intermittent and ephemeral in nature and are prone to occasional flooding.

The headwaters of the Tongue River are located in the Bighorn Mountains, within Wyoming, to the southwest of the reservation. The Tongue River flows about 265 miles from its headwaters to its point of confluence with the Yellowstone River at Miles City, MT, and comprises the entire eastern boundary of the reservation. The main creeks draining from within the Reservation directly to the Tongue River include Tie, Logging, Pawnee, Kelty, Stebbins and Reservation Creeks. The area drained by these creeks is generally east sloping and opposite the Rosebud Creek drainage to the west. Tie Creek contributes flow directly to the Tongue River, draining an area entirely within the boundaries of the Reservation. At its confluence with the Tongue, Tie Creek has a watershed area of about 52 square miles, which receives about 13 inches of precipitation per year and produces an annual average discharge of about 3,770 acre-feet. Logging, Pawnee and Kelty Creeks receive about 13 inches of precipitation per year and collectively drain an area of about 95 square miles entirely within the Reservation to the Tongue River. Stebbins and Reservation Creeks have a combined watershed area of about 50 square miles, which is within the reservation boundaries. The area receives about 14 inches of annual precipitation and contributes about 4,060 acre-feet per year to the Tongue River.

Rosebud Creek drains the western part of the reservation and receives flow from surface water runoff and groundwater input, mostly from within the reservation. The headwaters of Rosebud Creek are centered near the southwestern corner of the Northern Cheyenne Reservation and occupy non-reservation areas to the south and Crow Indian Reservation lands to the west and southwest, in the Wolf Mountains. Lane Deer and Muddy Creeks form the principal drainages within the reservation. These creeks contribute water to Rosebud Creek at their respective confluences within the Reservation. Other creeks like Rye Grass, Miller and Green Leaf Creeks begin on the Reservation but discharge to Rosebud Creek off of the Reservation. Rosebud Creek is highly variable from year to year and month to month. Peak flows are a result of snowmelt, precipitation and runoff occurring from late winter through midsummer. Maintenance of flow during the remainder of the year is governed to some extent by groundwater input and spring flow. Much of the total accretion of Rosebud Creek takes place on the reservation and diminishes downstream.

The quality of surface water within the watersheds previously discussed is important to the Northern Cheyenne Tribe. There are many sources of impairment with potential upstream effects on the Northern Cheyenne surface water quality. In addition, water quality on the reservation has been heavily impacted by cattle grazing around springs and

along streams, causing increasing sediment and nutrient levels.

1.2.5 Fisheries

The following information is from *The Northern Cheyenne Tribe and its Reservation*, a report to the Bureau of Land Management and the State of Montana Department of Natural Resources and Conservation, prepared by the Northern Cheyenne Tribe, April 2002. The report can be found in its entirety at:

The aquatic resources on the reservation are diverse including some 32 different fish species. The major streams of concern on the reservation are the Tongue River and Rosebud Creek. Rosebud Creek could support a game fish population with assured flow and temperature control. Rosebud Creek is not suited for trout, but it could support small mouth bass. This species prefers cool water streams with extensive riffle areas and clean bottoms. In 1973, the Tongue River was sampled in the vicinity of the Reservation, and some data was generated regarding species composition and distribution. Small mouth bass have been established in the river and sampling showed this to be a reproducing population. Other important sport fish included walleye, sauger, northern pike, and channel catfish. In addition, the Tongue River is unique in supporting the only population of rock bass in Montana.

In 2001, the Montana Cooperative Fisheries Research Unit, Montana State University – Bozeman conducted a Native Fish Investigation of the Tongue River in 2001. The area of study along the Eastern Boundary of the Northern Cheyenne reservation contained thirteen species of fish (See Table 1. * = non-native species.)

Table 1. Tongue River Fish Species. Total number of fish collected along the Tongue River Eastern Boundary of the Northern Cheyenne Reservation (Trenka, 2001).

Common Name	Scientific Name	Number of Fish
Shorthead redhorse	<i>Moxostoma macrolepidotum</i>	200
White sucker	<i>Castostomus commersoni</i>	58
River carpsucker	<i>Carpoides carpio</i>	37
Carp*	<i>Cyprinus carpio</i>	34
Longnose sucker	<i>Catostomus catostomus</i>	15
Channel catfish	<i>Ictalurus punctatus</i>	14
Flathead chub	<i>Platygobio gracilis</i>	13
Smallmouth bass*	<i>Micropterus dolomieu</i>	12
Stonecat	<i>Noturus flavus</i>	3
Black crappie*	<i>Pomoxis nigromaculatus</i>	3
Rock bass*	<i>Ameiurus melas</i>	2
Longnose dace	<i>Rhinichthys cataractae</i>	2
Mountain sucker	<i>Catostomus platyrhynchus</i>	1
Total	13	394

1.2.6 Soils

The forest soils on the Northern Cheyenne Reservation are formed from weakly consolidated red sandstones, infertile shales, and porcellanite of the Fort Union and Wasatch Formations. These soils are typically silty and clayey with moderate to strong horizon development. Clayey soils are both relatively impermeable and very pliable when wet. Accordingly, clayey soils are highly susceptible to compaction from crawler tractors and rubber-tired skidders. When saturated, roads constructed on these clayey soils can quickly deteriorate into a slick gumbo that is all but impassible. Once dry (usually by mid summer), the same roadbeds sometimes form a thick layer of fine dust.

1.2.7 Minerals

The following information is from *The Northern Cheyenne Tribe and its Reservation*, a report to the Bureau of Land Management and the State of Montana Department of Natural Resources and Conservation, prepared by the Northern Cheyenne Tribe, April 2002. The report can be found in its entirety at:

Mineral resources on the Northern Cheyenne Reservation consist primarily of coal and its derivatives. There are no known occurrences of metallic minerals. Nonmetallic minerals include building stone, sand and gravel, bentonite, claystone, and clinker deposits.

Coal is one of the most abundant and valuable mineral resources on the Northern Cheyenne Reservation. The Tribe controls an estimated 450,000 acres of coal rights lying in Bighorn and Rosebud Counties, MT. (Stagg, 1994). The coal resources on the reservation, contained within the Fort Union Formation, are classified as subbituminous in rank, with a relatively high moisture content, a low ash and sulfur content, and a relatively high heat content.

Several estimates of the coal reserves on the Northern Cheyenne Reservation have been made. The US Geological Survey and the US Bureau of Mines estimated the total coal reserves on the Reservation to be 23 billion tons, of which 5-6 billion tons may be mined by surface methods. A more specific study was conducted in the vicinity of Rosebud Creek which estimated that there are 4.8 billion tons of coal in that region, of which 1.8 billion tons is strippable. A study by Stagg Engineering on the Knobloch Coals on the reservation near the Tongue River estimated coal resources to exceed 56 billion tons of coal, of which 3.3 billion tons would be strippable. In all cases, it has been estimated that the Northern Cheyenne Tribe owns at least 5 billion tons of minable coal on the reservation.

The Northern Cheyenne Reservation has been prospected for oil and gas intermittently since 1952, but none has been found. Geologic relations and trends indicate that oil and gas accumulations could be present on the reservation and increased attention is given to the Greybull Sandstone. Potential reserves for this lead are estimated at 6.4 million barrels of oil. Confirmed oil and gas resources on the Northern Cheyenne Reservation cannot be quantified at this time.

Initial estimates of methane gas on the Reservation were approximately three billion cubic feet. Five wells were drilled on the reservation and minimum amounts of gas were found. The highest gas content measured was 65 cubic feet per ton. At that time, the range of profitable yield was 55 to 164 cubic feet per ton, and the conclusion of the study was that methane gas development would be uneconomical. In 1991, the Tribe received funding from the BIA to evaluate the Reservation's coal beds for the presence of methane gas. Two wells were drilled and a variety of tests were performed both on the well and on the core and cuttings. It was determined during this project that the outcrop pattern of the coal beds along the topographic divide suggests that most of the coal beds between the Tongue River and Rosebud Creek will have a low hydrostatic head and minimal amounts of methane. This does not detract from the high potential for methane retained in a coal seam totally disconnected to outcrop.

Bentonite is a type of clay consisting essentially of the mineral montmorillonite. It is used in drilling mud, foundry sand, animal feed, and for waterproofing and sealing, pond lining, and many other industrial applications. The bentonite exposed on the Northern Cheyenne Reservation is not of sufficient quality or quantity to be of significant potential economic importance; however, the reserves are adequate for the local needs of the Northern Cheyenne Tribe in the foreseeable future.

The tribe has locally mined sandstone for construction purposes for many years. Sandstone outcrops on the reservation are extensive; however, most of it is too massive or not sufficiently indurated to be suitable for mining. Clinker deposits are used to a limited extent as a building and ornamental stone. These resources will continue to be used locally and represent a valuable resource to the tribe although little economic value can be assigned.

The Tongue River Member of the Fort Union Formation contains claystone and shale that is suitable for making brick, and could also be used as a lightweight aggregate for concrete. Test results just south of the reservation performed by the Montana Bureau of Mines and Geology suggest that the reservation contains substantial and wide spread clay resources suitable for brick and aggregate uses.

Clinker is a term used to describe the partly melted and vitrified rock that are produced from the fusing and melting of an overlying formation by the intense heat that rises from an underlying burning coal bed. Coal beds in the Tongue River Member of the Fort Union Formation more than about 5 feet thick commonly have burned along their outcrops, leaving conspicuous shades of red, erosion-resistant rock on the Reservation. Clinker deposits are abundant on the reservation. The greatest potential use for clinkers on the Northern Cheyenne Reservation is for road material. Clinker is also crushed and used for roofing granules and walkways, etc.

Productive deposits of sand and gravel occur along the Tongue River and Rosebud Creek. The deposits are used locally for road construction and maintenance; however, these deposits are neither plentiful nor of particularly good quality to be used as an economic resource.

1.2.8 Agriculture

Predominate agricultural crops consisted of hay, such as grass, alfalfa hay and seed, and corn for silage and grain. A pumping project, the Tongue River Irrigation Project, was established in the early 1900s. This would eventually serve 1,380 acres of reservation land. Irrigated lands along the west side of the Tongue River include 14 Indian irrigation units.

Historically there were a number of small diversions along Rosebud Creek, such as the Government Ditch south of Busby. Currently on the reservation, 11,799 acres are dry-farmed and 1,794 acres are irrigated. A study conducted by HKM in 1976 estimated that the reservation had potential 21,160 acres as irrigable by gravity or sprinkler systems. There are presently two sprinkler systems present on Rosebud Creek within the reservation.

In 2006 the Realty Branch of the Northern Cheyenne Agency administered 94 Farm & Pasture leases comprised of 9,450 acres. Lease revenue generated from these trust lands totaled \$92,453.00.

1.2.9 Recreation

The reservation has developed recreation sites, picnic areas at Ice Wells and Morning Star View and campgrounds at Crazy Head Springs, Lost Leg Lake, and Conservation Corp Camp. Virtually the entire reservation land area is used by various individuals for outdoor recreation. Popular activities include hunting, fishing, camping, berry picking, herb/medicine gathering. The Northern Cheyenne Tribe has a PL 638 program entitled the Parks & Recreation Program Administered by the Tribal Natural Resources Program.

1.3 Archaeology & Historical

Known archaeological site types on the reservation include stone feature sites such as stone circles, cairns and rock alignments, as well as surface artifact concentrations (lithic scatters), buried camps and bison kills. The time range for these sites extends from nearly 10,000 B.P. to early contact.

The landscape and geological deposits have a profound effect on the nature and placement of archaeological sites. Of particular interest on the Northern Cheyenne Reservation, as well as for southeast Montana in general, are deposits of porcellanite. Porcellanite is shale that has been metamorphosed by natural coal burns, resulting in a fine-grained stone that served as a primary raw material for prehistoric tool makers. Consequently, many archaeological sites contain this material, and many prehistoric quarries and workshops are located where high-quality deposits of porcellanite are exposed. Of the 900 sites recorded on the Northern Cheyenne Reservation over 50% are prehistoric camps and workshops with porcellanite as the dominant material.

Sandstone and scoria outcrops are also common throughout the reservation. Many sandstone outcrops offer flat smooth surfaces for the creation of rock art that range from

prehistoric carvings to twentieth century graffiti. Many of the sandstone and scoria outcrops include sheltered areas and have been used both prehistorically and historically for shelter and the placement of graves. Additionally, the stone from these outcrops has been used in constructing a variety of stone features (i.e. cairns, circles and miscellaneous structures). Stone feature sites compose over 13% of all sites recorded on the Northern Cheyenne Reservation. While bison kills, food processing sites, and rock art sites are also known to occur on the reservation, these three site types are fewer in number and represent less than 3% of the overall recorded sites.

Sites dating to the historic period include a variety of buildings and structures, as well as surface depressions, where the structures have been previously removed. Most post-date the establishment of the reservation. These include residences and other commercial properties, as well as structures and facilities associated with the farming, ranching and mining activities. These sites represent over 10% of all sites recorded on the reservation.

1.3.1 Cultural & Traditional

Cultural sites on the Northern Cheyenne Reservation include a variety of tangible and intangible resources. Many of the prehistoric sites are culturally important to tribal members, and are therefore not only important for their scientific value, but also for their traditional historic value. Some rock art sites, and some stone features (cairns and medicine wheels) continue to have religious and cultural value.

Many tribal members continue to actively pursue traditional religious practices on the reservation, and approximately 25% of recorded sites in the BIA database are related to these ceremonial activities. They not only include larger structures, such as Sundance lodges, but also small personal sites, such as fasting structures, sweat lodges, cloth offerings, and graves. Isolated graves occur in a relatively high frequency on the Northern Cheyenne Reservation, and tend to be located in secluded areas.

Water, mineral, plant and animal resources are important to the Northern Cheyenne both culturally, and religiously. While these resources are tangible, they are often considered as intangible cultural resources because they have no obvious manmade modifications, and their importance may not be readily apparent to outsiders. Many springs have spiritual importance and spirits or spirit beings associated with them. Some of the important springs can be readily identified when cloth offerings are associated with them, but many have no such tangible manmade intrusions.

Cheyenne ceremonial practitioners regard water as part of the overall cosmology of life. On one hand, the great serpent "menehe" guards and protects the springs and waterways and could potentially bring harm and suffering to those who do not follow proper protocol. On the other, great care, respect, and spirituality is given to these sacred sites. Subsequently, during certain times of the day, waterways and springs are held with the highest respect and carefully negotiated as one makes their way near water.

Plants and animals have traditional cultural uses in ceremonies, as medicines and as traditional foods. Mineral deposits throughout the reservation area contain a variety of paints, which are collected and used for ceremonial purposes. Important plant species include sages, grasses, willows and junipers. Deer and antelope are not only an important food resource, but many of their parts are used in ceremonies. Animals such as the badger also have spiritual value. The badger is the all-knowing one of the underworld. Badgers are held with high respect and are part of ceremonial activities. Eagles and other raptors have always been considered important to the Northern Cheyenne, and have considerable spiritual value.

Many Northern Cheyenne traditional religious practices are personal and private, and timbered tracts on the reservation often offer the seclusion needed to perform some ceremonies. Many of these sites are not formally recorded because they leave little or no tangible evidence, and because knowledgeable tribal members do not discuss these sites out of respect for the sites and their practitioners. Consequently, many cultural and religious sites in the timbered areas remain confidential.

Because of timber harvests, many cultural or religious sites may be affected since the practitioners do not leave much physical evidence of the cultural or religious activity. This creates a dilemma of whether or not an area has cultural and/or religious significance and whether or not that area should be protected if in fact someone has intimate knowledge of the site.

1.3.2 Socio-economic

As stated previously, forestry has traditionally been a small but important part of the reservation economy. Forestry-related jobs employing members of the local community include logging, tree planting, pre-commercial thinning, firefighting, and rehabilitation of lands affected by management activities such as timber harvest and fire suppression.

The Northern Cheyenne Tribe has historically derived considerable revenue from the sale of forest products, with some estimates indicating half or more of the Tribe's annual budget coming from stumpage paid on timber sales. Since the shutdown of the Tongue River Lumber Company sawmill in Ashland in 2000 revenues from timber sales have dwindled, and the sharp decline in the timber market since 2006 along with sharp increases in fuel prices during the same period has resulted in increasingly lower prices being paid for stumpage on timber sales. Current revenue streams from timber sales are minor and seemingly insignificant when compared with those of a decade ago.

In terms of resource development on the Northern Cheyenne Reservation, the Tribal populace favors renewable versus non renewable. For instance, in spite of the conflict it causes with traditional values and attitudes toward land and resources, many tribal members felt that if mining is to occur, then the tribe and its members should reap some benefit. "However, other Northern Cheyenne, particularly some of the more traditional elders, were firmly against energy development because of its disruption to the land and environment." (BLM, 2003).

1.4 Threatened & Endangered Species

The US Fish and Wildlife Service (USFWS) was contacted by letter dated August 27, 2007 to request a list of Threatened or Endangered species that occur within the proposed project area. The USFWS, as indicated in a letter dated September 14, 2007, does not anticipate the occurrence of any federally listed threatened, endangered, candidate or proposed species in the proposed project area.

In early 2008 the black footed ferret was reintroduced to the sagebrush flats west of Ashland on the eastern part of the reservation. Eight ferrets were released initially on January 5th, 2008. Eight more were released on October 24th, 2008. Another eight were reintroduced on October 27th, 2008. These were released in the Tongue River Watershed. Black footed ferrets are on the Endangered Species List and all management activities on the reservation must include measures to mitigate any impact on the ferret population. Future reintroduction efforts may include the Kit Fox.

1.5 Air Quality

The entire Northern Cheyenne Indian Reservation is a re-designated Class I Air Shed. Preservation and protection of the pristine air quality is very important to the Northern Cheyenne Tribe.

The Northern Cheyenne Air Quality Division monitors air pollution from sources on and off the reservation. The town of Lame Deer is a PM10 non-attainment area. This means that the air quality has exceeded the National Ambient Air Quality Standards. The main source of this problem is re-entrained road dust. This is being addressed through dust abatement activities such as improved curbs and gutters on the streets, new paving of dirt roads, and application of magnesium chloride on the highways during the winter months. These activities for pollution control are improving the air quality in Lame Deer.

The Northern Cheyenne Air Quality Division works with the BIA Forestry Department when it comes to issues related to prescribed burning. When conditions look right for burning, forestry checks with the Air Quality Division and the Air Quality Administrator then checks the National Weather Service website and approves the burn if conditions are right and doesn't approve if conditions are not right for burning. This arrangement works out well for both departments and to date there have been no problems with prescribed fires.

When logging activities take place, especially in the dry season (summer and fall), re-entrained road dust issues arise. The traffic from logging trucks going in and out of the logging areas quickly breaks down the dirt and clays that make up the road material. This translates into dust that is blown into the ambient air that causes health and visibility issues. This dust is particulate matter (PM) that is very fine and cause lung irritation and impairment, especially for the young, the old, and people that already have lung problems. The restricted visibility causes restricted areas so that you can not see for more

than a few hundred feet. Visibility is a major component of Class I air shed status and reduced visibility from particulate matter compromises that status.

There are ways to address dust abatement so that it limits PM and visibility effects on the reservation during logging activities. Roads can be watered down with water trucks and/or magnesium chloride can be applied. Also, low speed limits can be posted and enforced to limit dust emissions.

CHAPTER 2. GOALS & OBJECTIVES

The Bureau of Indian Affairs is mandated by law to manage Indian lands held in trust for the benefit of the Indian owners in such a manner as to preserve the long-term productivity of the land. The Bureau of Indian Affairs is committed to the policy of sustained yield management and to providing appropriate management plans as stated in Title 25 Code of Federal Regulations Part 163, General Forestry Regulations; the Department of Interior Manual; and 53 IAM. The Bureau of Indian Affairs is also committed to a policy of self-determination as mandated by Public Law 93-638 – Indian Self-Determination and Education Assistance Act.

2.0 Statutory Objectives

The Tribal Council will determine the highest and best use of the Northern Cheyenne forest lands.

- ✓ Effective management and protection through the application of sound silvicultural and economic principles shall develop, maintain, and enhance the commercial forest lands in a perpetually productive state. Adequate provisions shall be devised for new forest growth as timber and wood products are removed.
- ✓ Regulation of the annual harvest will provide method and order in harvesting the tree capital so that long-term sustained yield is assured. Timber and wood harvests and other silvicultural methods shall provide opportunity to regulate the forest growth, composition, and health.
- ✓ Development of the forest by the Indian people shall promote self-sustaining communities, so that the tribe may receive from its property not only the stumpage value, but also individual tribal members may benefit from whatever labor and profit the forest is capable of yielding.
- ✓ The forest shall be managed in such a manner as to retain its beneficial effects in regulating water run-off and minimizing erosion.
- ✓ The forest shall be managed and protected to maintain or improve timber production, soil productivity, grazing, wildlife, fisheries, recreation, aesthetics, cultural and other traditional values to the extent that such action is in the best interest of the tribe.
- ✓ The forest will be managed to comply with National Environmental Policy Act (NEPA) requirements, the Endangered Species Act, and the National Historical Preservation Act, and other applicable federal regulations.
- ✓ Provide for the active participation by the allottee(s) in all land management

decisions. The wishes of the allottee(s) shall be given careful consideration in the sale preparation process.

- ✓ Individual timbered allotments shall be managed for the benefit of the respective owner(s), allowing for self-use by the owner(s) and the salvage of dead or dying trees.
- ✓ Individual timber allotments shall be managed for multiple uses including (but not limited to) timber production, wildlife, recreation, water, grazing, and aesthetics, according to the objectives and wishes of the allotment owner(s).

2.1 Specific Goals

- ✓ Provide income for the Northern Cheyenne Tribe.
- ✓ Provide employment for the Northern Cheyenne Tribally enrolled members.
- ✓ Protection and non-degradation of Surface Water Quality on the Northern Cheyenne Reservation.
- ✓ To manage the timber resource in an environmentally sound manner with other land uses.
- ✓ Ensure the protection of culturally and archaeologically significant resources, areas and sites.
- ✓ To progressively increase annual growth and in turn, allowable cut where feasible through intensive management.
- ✓ To regulate harvest under the periodic sustained yield concept with a maximum fifteen year harvest of 103.5 million board-feet.
- ✓ To conduct the harvest of timber in a manner which provides for sustained yield, employment of tribal members, and the adjustment of growing stock to its optimum level of volume, spacing, quality and species distribution.
- ✓ To encourage economically feasible local operations such as logging, post and pole harvest, small lumber mills, house log and other forest product manufacturing that will generate Indian employment and Indian business.
- ✓ To continue pre-commercial thinning and reforestation concentrating on more productive sites, and encouraging improved utilization through allowing free use salvage.
- ✓ To protect the forest from insects, disease, and fire and take prompt and effective suppression action when required.

- ✓ To assure timber sale opportunities for Northern Cheyenne logging enterprises.
- ✓ To intensively manage streamside management zones (SMZs) to protect water quality, fish habitat, and wildlife corridors while reducing hazardous fuel loadings and promoting the growth of culturally important trees and plants.
- ✓ To intensively manage timber stands on a landscape or watershed basis. This will concentrate logging in one area and reduce the number of entries on the logging units. This will in turn promote road closure and wildlife security.
- ✓ To effectively reduce heavy forest fuel loadings that contribute to the high risk of uncontrollable wildfires in general. This will include the development of fuel breaks and other specific strategies to combat wildfires before they start.

2.2 Management Objectives

The tribe has established a set of priorities which will shape the management of the forest in the near term which will be addressed in later sections of the Plan. Most represent a continuation of current forest policy.

Identify the tribal lands to be managed for commercial timber production. Identify and set aside portions of the forest as wild, natural areas for use by tribal members for personal, traditional, and religious purposes. Identify and set aside portions of the forest that have overriding aesthetic value.

Identify and set aside portions of the forest in stream buffer zones and riparian areas to assure strict protection of tribal watersheds.

Continue pre-commercial thinning and reforestation, prioritizing treatment of stands by site index, with a goal of eliminating the entire backlog of overstocked stands.

Follow a timber harvest schedule that provides for a long-term sustained yield of timber volume cut. Harvest an allowable annual harvest of 6.9 million board-feet. Place highest priority on the harvest of stands where management activities have already occurred so as to not lose the benefit of earlier management action.

Pursue the salvage of dead and dying timber, where feasible. Increase the salvage and utilization of un-merchantable material such as firewood and fence rails.

Continue the existing arrangement whereby the Northern Cheyenne Tribe's PL 93-638 forest development contract be maintained and the PL 93-638 Cooperative Agreement.

2.3 Needs Assessment

The objectives of the forestry program are to proceed toward meeting the evolving needs

of the tribe and the BIA's trust responsibility in an environmentally sound and sustainable manner. This will be done by implementing a wide range of forest management treatments designed to improve forest health, reduce threats to the forest, and to preserve the accomplishments of earlier management activities. Treatments will incorporate sound silvicultural principles and will include harvest of mature trees, thinning of overstocked stands, planting of understocked stands, and the reduction of hazardous fuel loadings through means of mechanical treatment and prescribed fire.

2.4 Summary of Management Alternatives & Environmental Consequences

Alternative 1: No Action (Custodial Management)

This alternative would not permit the proposed action to be implemented. By Bureau of Indian Affairs policy, only seven (7) actions are allowed for Agencies operating without a current approved Forest Management Plan. Those actions are:

- 1) Preparation of a Forest Management Plan (25 CFR 163.11)
- 2) Emergency sale of timber on allotted lands held in trust (25 CFR 163.14(b)).
- 3) Free use cutting without permit (25 CFR 163.27).
- 4) Fire management measures (25 CFR 163.28(a), (b), and (c)).
- 5) This includes suppression, prevention and soil stabilization.
- 6) Trespass protection and prosecution (25 CFR 163.29).
- 7) Insect and disease control (25 CFR 163.31(b)).

Employment would be limited to a small forestry staff to investigate timber trespass cases and prepare timber sales to salvage fire- and insect-damaged stands of mature timber. This would result in approximately two BIA Full Time Employees (FTE's), no Tribal FTE and one-half an FTE as a private contractor annually.

Alternative 2: Sustained Yield Management (harvest 6.9 million board feet (mmbf) per year).

Harvest 6.9 mmbf of commercial forest products per year. This level of harvest has been arrived at through analysis of the continuous forest inventory plot data collected in 2005 and 2006 and is supported by the Northern Cheyenne Tribal Council as the proposed action.

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 leave a residual volume of approximately 12% of the merchantable timber currently available in trees left to provide a seed source for the new forest.

This alternative would provide for the implementation of the proposed Forest Management Plan. This alternative would include harvest of some of the stands within identified compartments as detailed in Table 1 which is the proposed Fifteen Year Harvest Schedule.

Funding would be allocated to manage timber sales, and to continue forest development activities such as thinning and planting. Slash resulting from timber management activities would be disposed of by piling using tractors equipped with brush blades and burning piles under specified conditions to insure complete containment. In stands with unusual fuel or reforestation conditions planting site preparation and slash disposal methods would be prescribed to meet the specifically identified needs. Hazardous Fuels Reduction Program funding could be used to clean up heavy loadings of unmerchantable timber.

This alternative would incorporate a yearly review of timber harvesting practices and new federal and tribal regulations. Only forests in the commercial timber base would be harvested with this alternative. Reserved lands would be excluded (See Appendix A). There are also some lands that have seasonal or other restrictions; these lands would be considered for harvest within the confines of the particular restriction. Those restrictions are listed as mitigation measures at the end of this chapter.

Outputs would be 6.9 mmbf of saw logs, firewood, chips and other commercial forest products per year. Sales would require the mitigation measures listed in this chapter be followed.

Forest development which includes commercial forest stand improvement projects and reforestation would be carried out as needed or as funding is available. There is currently a backlog of 69,200 acres of thinning and 18,622 acres of planting on the Northern Cheyenne Reservation. This would result in a move toward more intensive forest management throughout the forested portions of the Northern Cheyenne Reservation.

The new road construction and improvement of existing roads under this alternative would be the least needed to implement any of the action alternatives. Exact locations and distances will be analyzed in project-specific NEPA documents developed by an ID team for individual sales. The mitigation measures listed in this EA will be the overriding requirements for all forestry activities during the planning period.

Employment would include forestry staff and fuels staff to deal with timber sales, resultant slash and forest development activities. This would result in approximately 10 BIA FTE, 6 Tribal FTE and 12 contractor FTE annually.

Alternative 3: Accelerated Harvest (harvest 10 mmbf per year).

This alternative would result in 150 mmbf of timber harvested over the next 15 years on approximately 103,000 acres if all commercial timber is removed from all of the acres. This alternative would include harvest of most of the stands within identified compartments as detailed in Table 3 which is the Fifteen Year Harvest Schedule. Additional stands would need to be added to meet this harvest level near the end of the planning period. The focus of this alternative is upon harvesting older stands before they degrade so as to capture the value of these stands. The level of harvest proposed in this

alternative is not sustainable and subsequent forest management planning periods will be subject to reduced harvest level if this alternative is adopted.

Outputs would be 10 mmbf of saw logs, firewood, chips and other commercial forest products per year. Sales would require the mitigation measures listed in this chapter be followed.

Under this alternative forest development and reforestation may not be able to keep pace with the demand as more acres would need these treatments and funding and personnel may or may not be sufficient.

The new road construction and improvement of existing roads under this alternative would be about one and one-half times that needed to implement alternative 2. Exact locations and distances would be analyzed in project-specific NEPA documents developed for individual sales.

Employment would be approximately 16 BIA FTE worker years, 10 Tribal FTE and 20 contractor FTE annually as increased personnel would be needed for increased timber sale activity and forest development. This would be an increase of 8 BIA FTE over the current program and would require about \$500,000 additional funding annually.

2.5 Environmental Consequences (impacts) Summary

Table 2. Environmental Consequences. Varying impacts relative to three alternatives for timber management.

Affected Environment	Alternative 1 (No action)	Alternative 2 (Harvest 103.5 MMBF)	Alternative 3 (Harvest 150.0 MMBF)
Air Quality	Brief reductions in air quality from more frequent wildfires.	Minor dust production from timber harvest activities; brief reductions in air quality from occasional wildfires.	Minor dust production from timber harvest activities; brief reductions in air quality from occasional wildfires.
Water	Water production reduced; siltation following more frequent wildfires.	Water production maintained; siltation from road building and occasional wildfires.	Water production increased; greater siltation from road building and occasional wildfires.
Soil	Possible mass wasting and heat damage following wildfires.	Increased threat of erosion and soil compaction from timber harvest activities.	Increased threat of erosion and soil compaction from timber harvest activities.

Vegetation	Reduced productivity; increased threat of loss from wildfire; less structural diversity.	Increased productivity of residual trees; improved forage production.	Increased productivity of residual trees; improved forage production; less structural diversity.
Wildlife	Reduced habitat and forage quality.	Improved habitat and forage quality.	Slightly improved habitat and forage quality.
Cultural/Historical Resources	Minimal impacts except during more frequent fire suppression activities.	Increased risk of disturbance during management activities.	Increased risk of disturbance during management activities.
Recreation	Decreased quality of recreation opportunities.	Increased quality of recreation opportunities.	Slightly increased quality of recreation opportunities.
Fire	More frequent and more severe fires.	Average fire activity levels and severity.	Average fire activity levels and severity.
Employment and Revenue	Little employment from management activities outside of fire suppression. Revenue only from low-value salvage sales on allotted lands.	Increased employment from management activities. Revenue from sales of higher-value products on all lands. Employment and revenue levels fairly steady throughout planning period.	Initially, greatly increased employment from management activities and greater revenue from sales of higher-value products on all lands, then decline in later years of planning period.

2.6 Recommended Alternative

Alternative 2, Sustained Yield Management, is the preferred alternative of the Northern Cheyenne Reservation forest. Primary features of active management include preparation and marketing of logging units designed to harvest the equivalent of 6.9 million board feet (MMBF) of forest products from the reservation forest annually; planting 1,500 acres of former forest land annually to promote regeneration following catastrophic wildfires; precommercial thinning of up to 5,000 acres of young overgrown timber stands annually; and a combination of mechanical and prescribed fire treatments to reduce hazardous fuel buildup on up to 3,000 acres annually. The goal of this management approach is to bring an increased proportion of the reservation forest into a regulated state. Management will focus on those areas that have received management activity in the past in order to maintain and build upon the benefits of previous management activities and preventing the forest to revert to pre-managed conditions.

Management will include activities emphasized at improving the protection of communities against wildfire; improving the extent and condition of plant communities important to cultural and religious use; enhancing recreational opportunities; and improving the production and quality of watersheds and protecting wetlands and riparian areas from degradation.

The recommended alternative was chosen by representatives from the Northern Cheyenne Tribal Council after lengthy discussion with the interdisciplinary team that developed the environmental assessment for this plan. The decision that selected this alternative was informed by the results of a public opinion survey of forest management activities that was administered in July 2008. This survey is discussed in greater detail in Appendix B. Issues of greatest concern to Tribal members were found to be employment, water quality, tribal income, and wildlife habitat. The recommended alternative was chosen by representatives from the Northern Cheyenne Tribal Council as that best able to address these concerns and was supported by the full membership of the Council.

CHAPTER 3. RESOURCE PROTECTION & IMPLEMENTATION PLAN

3.0 Tribal Protection Codes (or Standards)

Fish, Wildlife & Recreation Ordinance DOI-023 (1996)

An ordinance of the Northern Cheyenne Tribal Council setting forth for the Administration and Management of Fish, Wildlife, and recreation on the Northern Cheyenne Reservation. Including Section 4.1.C Non-Members/Non-Indians: All forms of hunting shall be closed to non-members except as authorized by the Tribal Council/Department.

Water Quality Standards DOI-016 (2002)

A resolution of the Northern Cheyenne tribal Council adopting and making law the promulgated water quality standards and establishing the date for implementation and enforcement of the attached, incorporate by reference Northern Cheyenne Tribe's Water Quality Standards.

Aquatic Lands Protection Ordinance DOI-001 (2003)

It is the policy of the Northern Cheyenne tribe that all waters and aquatic lands on the Reservation are to be protected and preserved, and that the degradation of Reservation waters and aquatic lands be prevented or minimized through the reasonable regulation of such resources.

Tribal Emergency Response Committee DOI-100 (2006)

A resolution of the Northern Cheyenne Tribal Council Adopting the Northern Cheyenne Emergency Response and Preparedness Plan.

3.1 Fire Management Program

Prevention, community assistance and education will be attained using FIREWISE workshops identified by the Northern Cheyenne Agency fire staff. The regional fire/fuels staff will help with the scheduling of these workshops with the assistance of NIFC Prevention Specialist. The prevention technician at the Northern Cheyenne Agency has already contacted most of the private homeowners within the WUI lands identified within the boundaries of the Northern Cheyenne Reservation. These contacts will need to be made again in order to determine if a FIREWISE workshop will be required. The fire prevention technician will be required to contact the communities to determine whether any of the communities would qualify and want to prepare a Community Wildfire Protection Plan (CWPP) and apply for a WUI Mitigation grant. If the communities have the need for such a plan or mitigation grant or help in writing these, the Northern

Cheyenne along with the NIFC Prevention Specialist will schedule a grant writing workshop for each community if needed.

3.1.1 Prevention

The BIA Branch of Forestry disseminates fire prevention literature, and presents forestry and fire prevention education to local schools. National fire prevention programs sponsored by the BIA, USDA Forest Service and other agencies are also broadcast by regional television and radio stations. The BIA Branch of Forestry also participates in local events such as parades and other public gatherings to stress the need for fire prevention on the reservation. Arson Investigation of human caused fire occurs, under authority of the Department of Justice.

3.1.2 Pre-suppression

The Fire Management Office is supervised by the Fire Management Officer (FMO) who is responsible for developing, training and directing all fire protection activities. The FMO is assisted by experienced personnel from the regular forestry staff (BIA and tribal). Each year the BIA Branch of Forestry employs approximately 10 local people as seasonal fire guards who are available for immediate dispatch to wildfires throughout the reservation. There is a Fire Management Plan in place created by the Fire Branch that is updated on a periodic basis.

3.1.3 Suppression

Primary responsibility for wildfire suppression on the Northern Cheyenne Reservation is with the BIA Branch of Forestry, Fire and Aviation division, which has the ability to organize and dispatch fire line crews as needed for local fires, as well as to fire incidents throughout the country. The crews are prepared primarily for inter-regional dispatch, but also serve as a pool of locally available, trained personnel that can be called, as needed, for local wildfire suppression. BIA and Tribal personnel are also trained in wildfire suppression and are available to respond to fires locally.

A cache of fire-fighting equipment, including hand tools, protective clothing, and wildland fire engines are maintained at the BIA Fire Cache for immediate use.

Local fire departments managed by Northern Cheyenne Community Fire Protection in the towns of Lame Deer and Busby as well as the town of Ashland and the St. Labre Catholic Mission have provided additional support through on-going cooperative agreements with fire incidents on the reservation.

While primary responsibility for fire suppression belongs to the BIA Branch of Forestry, Fire and Aviation division, other BIA and tribal personnel will respond to wildfires as needed.

3.1.4 Fuels Management

The Northern Cheyenne Agency has a Fuels Specialist position and receives funding for Hazardous Fuels Reduction projects for Wildland Urban Interface (WUI) and non-WUI project areas. The intent of this funding is to implement hazardous fuel reduction treatments on the Northern Cheyenne Reservation lands. Due to past policies of excluding fire from the landscape over the course of one hundred years, our forested stands have accumulated dangerously high fuel loadings and unnatural stand structures that cause our stands to become stagnant, susceptible to insect and disease attack and mortality from wildfire. The mean annual fire return interval for our landscape was on the average of one fire every seventeen years. This produced open park-like stands with cool surface fires that cleaned up the forest floor and pruned the ponderosa pine stands to a safe level to prevent crown fires.

Since the 1980's the reservation has experienced some large stand replacing fires that have decreased the commercial timber base by as much as one half, from 10 mmbf to our present 6.9 mmbf annual allowable harvest of our timber stands. To mitigate these undesirable effects of large fires, the Northern Cheyenne Fire and Aviation program conducts and implements both prescribed fire and mechanical projects to help reduce the hazardous fuel loadings within our timber stands. The Environmental Assessment for the Forest Management Plan 2009-2023 Decision Notice selected the proposed action which includes implementing up to 3,000 acres of mechanical and prescribed fire treatments to reduce hazardous fuel buildup. The strategies and schedule for these treatments will be developed in either the Fire Management Plan or a separate Fuels Management Plan.

The key basic policies of the Fuels Management Program are as follows: will reduce risk and consequences of wildfire to communities and ecosystems, may restore and maintain healthy ecosystems, will promote the safety of firefighters, employees and the public, and meet land management objectives, and may be used to affect reductions in both naturally occurring fuels and fuels accumulations resulting from resource management activities. Specifically, treatments of fuels are to return or maintain ecosystems to the desired fire regime condition classes (1, 2, 3), through the use of prescribed fire, mechanical, biological or chemical methods. Refer to the below definitions of the fire regime condition classes. Fuels reduction treatments will be integrated with other resource management practices such as forest and range management practices, thus ensuring resource management objectives are met.

Currently, all burning on the Northern Cheyenne Reservation, including tribal allotted and private lands and require approval in advanced by way of a burning permit. The proposed Burning permits is reviewed and approved by the Tribal Air Quality Specialist, Fire Management Officer, Forest Manager and superintendent prior to issuance to the permittees. In general, burning permits are issued for a period not to exceed 24 hours from the time of approval.

3.1.5 Forest Development

The Forest Development Program is currently one of the responsibilities of the Northern Cheyenne Tribal Forestry department through a 93-638 contract that is administered by the BIA. Conduct of the Forest Development Program will be in accordance with the rules, regulations and directives specified in 53 IAM, Chapter 5, Supplement 5, PL 93-638 regulations and tribal regulations and policies.

The Tribal Forestry Department bids out about 90% of its forest development projects through a competitive bid process and has 170 eligible bidders/contractors. At present the Northern Cheyenne Tribe has added some other mandatory requirements that the contractors must meet in order to become fully eligible bidders. The department is working to get these contractors updated and fully eligible.

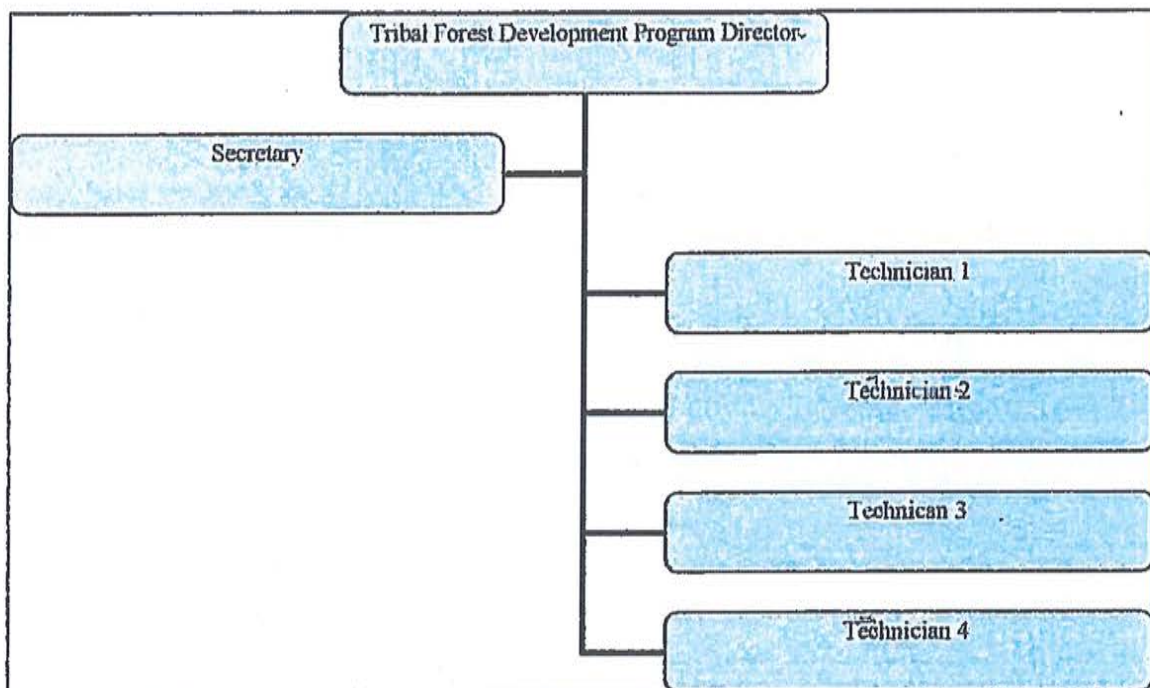


Figure 4. Tribal Forestry Organizational Chart. Tribal Forest Development Program PL93-638, PL93-638 Cooperative Agreement, and Memorandum of Agreement with Rocky Mountain Regional Office.

Normal activities include:

- Pre-commercial and seedling thinning of overstocked stands
- Tree Planting on non-stocked burns and on non-stocked harvest units
- Pine cone collection for improved seedling stock
- Conduct regeneration and stocking surveys on tree planting units
- Maintenance and closures of logging roads after forest development work has been completed
- Perform various Timber Stand Improvement (TSI) projects
- Advertise and bid out all planned projects competitively. If there is

insufficient competition for particular projects, then contracts are negotiated.

- Purchase seedlings using Northern Cheyenne seed stock from the Montana State Nursery for reforestation projects
- Conduct slash pile burning operations
- Scheduling of forest development projects will be done by the Tribal Forestry Director on an annual basis with projects prioritized by current needs and paid for with non-recurring funds.

During the next 15 year period, at present funding levels, between 1,000 acres per year can be pre-commercially thinned and between 250-300 acres per year can be reforested.

3.1.6 Prescription Burning

Prescription Burning on the Northern Cheyenne Reservation is a function of the Agency Fire Management Program. These prescription burns are coordinated with the BIA Forestry Timber Cutting Permits and Tribal Forestry Development Thinning and tree Planting Projects (See Figure 4.) Typical sequence consists of logging an area, then thinning, followed by prescription burning.

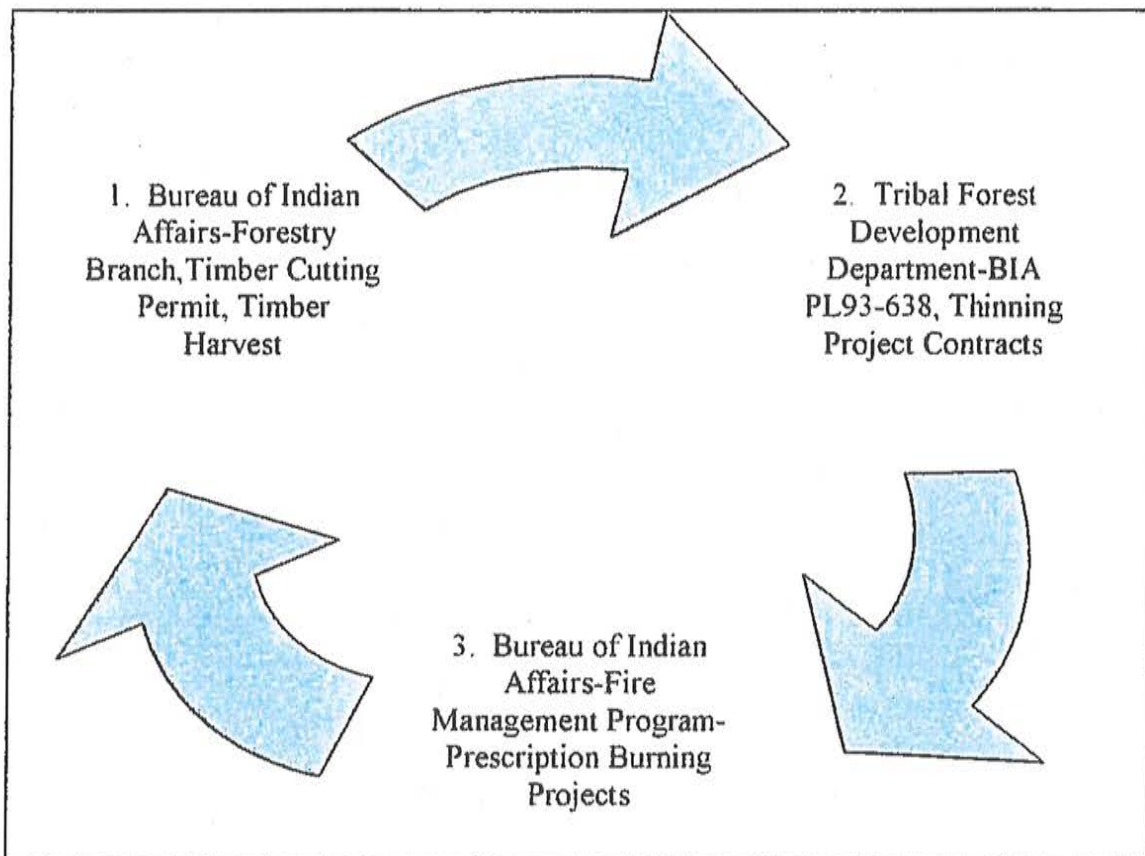


Figure 4. Prescription Burning Overview. Prescription Burning Projects relative to BIA Forestry Timber Sales and Tribal Forestry Thinning Projects.

3.2 Insect & Disease

From 1983 to 1994 the impact from bark beetle outbreaks, primarily pine engraver beetle (*Ips pini*) was severe, causing both high mortality and growth loss. The most active insects on the Reservation are the red turpentine beetle (*Dendroctonus valens*), the pine engraver beetle, and the mountain pine beetle (*D. ponderosae*). Bark beetle attacks are usually most damaging in overstocked and stressed stands.

Beetle activity peaks during the spring and summer months. The adult beetle produces either horizontal or vertical galleries under the bark in the tree's cambium layer, depending on the species, and lays its eggs. When the eggs hatch, the larvae mine the cambium outwards from the galleries and can kill the tree this way by girdling it. Additionally, many species of bark beetles are associated with fungal species that infect the tree when the beetle invades and reduce tree vigor, further increasing the susceptibility of the tree to bark beetle attack. After about a month of developmental time, new adults emerge and begin the search for new brood material.

Western gall rust (*Endocronartium harknessii*) is found throughout the forest, but so far damage has been relatively light. Management involves thinning out the infection sources. Another pathogen, red ray rot (*Polyporus inops*), is the major cause of wood decay in old-growth ponderosa pine. Red ray rot causes white pocket rot which slowly decays the heartwood of the tree. Red ray rot is difficult to detect in living trees, because fruiting bodies (conks) rarely develop on them. The fungus enters the tree through wounds such as broken branches, then spreads through the pith.

The Presale Foresters, through the Forest Manager, have primary responsibility to assure all treatments are silviculturally adequate to improve or maintain the health of the forest. The Presale Foresters will do this through the following means.

- Writing and reviewing silvicultural prescriptions concerning pest problems.
- Monitoring pest activity and gathering data.
- Providing assistance and training in identifying pest problems.
- Writing and distributing reports concerning insect and disease levels.
- Providing direction in controlling pests.
- Coordinating with USDA Forest Service insect and disease specialists.

3.2.1 Monitoring

Forest health conditions will be identified and monitored through the use of reconnaissance surveys, stand exams, aerial surveys, and photo mapping. Initially these surveys and exams will be used to develop a database for analysis using a Geographic Information System (GIS) database. Later, these surveys will provide monitoring and evaluation of past treatments and establish a base level to determine future treatments.

Annual aerial forest insect detection surveys are flown by the USDA Forest Service, Region 1 Forest Pest Management personnel to monitor insect outbreak intensity and

spread. Maps and digital data for GIS are furnished to the Branch of Forestry.

Analysis of data with GIS will alert the presale section of the Branch of Forestry when blocks are ready for follow-up inspection for treatment effectiveness and when further action is needed to ensure that treatment and target stand goals are achieved.

3.2.2 Reporting

The Presale Foresters are responsible for ensuring reports are completed in a timely manner. All forestry personnel are to report insect and disease sightings or damage to the Presale Foresters. In addition, informal reports from field crews will also provide data to update baseline data. A written report will be filed with recommended silvicultural treatments or further actions. Annual documentation on insect and disease problems will be submitted to the Rocky Mountain Regional Office.

3.2.3 Control

Controlling insect and disease pests will be accomplished through two methods, suppression and prevention. The Presale Foresters are responsible for data gathering, recommendations, and silvicultural prescription writing or review for all insect and disease treatments.

Prevention of harmful insects and diseases will be accomplished silviculturally. This work will occur annually as timber sales are developed. General silvicultural prescriptions will be modified to accommodate suppression work. Planning will be done annually, and by project, using the interdisciplinary approach and in cooperation with the USDA Forest Service.

3.2.4 Program Coordination

Agency pest management programs are coordinated with USDA Forest Service Pest Management staff, and with BIA and tribal staff for analysis, project planning, and environmental assessments.

3.2.5 Silvicultural Considerations for Forest Health

Silvicultural treatments are the preferred method to maintain forest health. Suppression projects remain a viable means of maintaining stand health for the short term. Silvicultural treatments will continue to be the long-term means of attaining and maintaining a healthy forest ecosystem. Silvicultural considerations for forest pests on the Northern Cheyenne Reservation are briefly discussed below.

3.2.6 Diseases

Brown cubicle butt rot (*Phaeolus schweinitzii*) and red ray rot (*Polyporous ineps*) are stem decays. Stem decays cause considerable loss of merchantable timber. These decays

enter the host through wounds and broken branches. When the wound becomes infected, the fungus moves fast through the tree.

Diseases such as red ray rot and brown butt rot adversely impact merchantability of timber by reducing the amount of lumber that can be manufactured from a given volume of wood. These types of rots also reduce the growth of a tree because the disease will decrease the amount of water and nutrients available for growth.

3.2.7 Insects

Mountain pine beetle (*Dendroctonus ponderosae*) and pine engraver beetle (*Ips pini*) cause the most damage in over-stocked and stressed stands of ponderosa pine. The mountain pine beetle usually impacts overstocked second growth ponderosa pine and is the second leading cause of bark beetle induced mortality on the Northern Cheyenne Reservation. The management of this pest requires reducing stocking density from 80 to 100 square feet of basal area per acre in ponderosa pine to 60 square feet.

The pine engraver beetle, which tends to be the leading cause of bark beetle induced mortality on the Northern Cheyenne Reservation, attacks and kills stressed ponderosa pine of all age classes. The pine engraver emerges in the spring from overwintering sites when average daily ambient temperatures reach 65° Fahrenheit. Newly emergent adults begin searching for suitable brood material. Once a host suitable for colonization has been discovered, pioneering males bore into the bark, construct a nuptial chamber and release an aggregating pheromone that attracts both male and female conspecifics. *Ips pini* males are polygamous and will mate with 1 – 3 females. Upon mating, females excavate egg galleries radiating outward from the central nuptial chamber. The egg galleries are oriented along the grain of the sapwood and form a distinctive tuning fork pattern. Eggs are laid in small niches along the walls of these galleries and packed in frass. The eggs hatch in about a week, and the resultant larvae mine outward from the egg gallery feeding in the phloem. *I. pini* larvae feed for approximately four weeks and then enter into a pupal stage. After pupation, newly formed adults emerge and begin the search for a new host to colonize.

This species of bark beetle typically produces two generations per year on the Northern Cheyenne Reservation. The first of the generations emerges around mid- to late April, and the second around mid-July. Brood selection and colonization activity for the pine engraver generally ceases around the beginning of August at which time adults begin searching for new overwintering sites.

Management of this pest is primarily through maintaining stocking control and control of green logging or thinning slash. Control measures include the following.

- Pre-commercial and commercial thinning are timed to avoid bark beetle emergence flights. Thinning slash is lopped into small pieces and scattered rather than piled.
- Logging slash in timber sale areas is concentrated in piles. Slash is then burned before the beetle flight occurs. Large slash piles do not need to be burned

immediately as the outer layer of the pile will preserve the slash of the inner layers, keeping it fresh and drawing beetles into the slash pile rather than having them take flight to seek fresh material.

- Restricting thinning activities between January and July will greatly reduce the green slash available as brood material for newly emergent populations. Slash produced during these months must be lopped to prescribed dimensions that have been found to diminish the viability of fresh slash as a food source for beetles. Material that is chipped or masticated is likewise unsuitable as a food source for beetles, and these treatments are suitable methods of slash disposal throughout the year.

3.3 Trespass Issues

Trespass on the trust lands of the Northern Cheyenne Reservation can take three forms; timber trespass, fire trespass, and road trespass. It is the duty of all BIA and Tribal personnel to report suspected cases of trespass in writing to the BIA Forest Manager. Type, location, and extent of the trespass will be included in the report. It is the Forest Manager's responsibility to investigate suspected trespass and, if a trespass has occurred, to determine the extent of damage and take the necessary actions to secure restitution as per 53 IAM Chapter 7.

3.3.1 Fire

Fire trespass occurs by:

- Anyone who willfully or negligently allows fire to escape from his land, or land of which he is in possession or control.
- Anyone who accidentally sets any fire on his own land or the land of another and allows it to escape his control without extinguishing it, or using every possible effort to do so.
- Anyone who, having knowledge of a fire burning on his own land, or lands of which he is in possession or control, fails or neglects to make every possible effort to extinguish the same, regardless of whether or not he is responsible for the starting or existence thereof.

Cases of fire trespass will be investigated by the Bureau of Indian Affairs to determine the type and amount of damages. Recovery of damages will also be done by the Bureau of Indian Affairs in accordance with 53 IAM Chapter 7 and other applicable laws and regulations.

3.3.2 Timber

Timber trespass occurs when timber, logs, or other forest products (such as firewood, posts, poles, or shakes) are cut and removed from trust lands without authorization through a timber sale contract or cutting permit. Most timber trespass on the Northern Cheyenne Reservation is inadvertent. Timber trespass from 1996 to 2007 amounted to a total of about 511 board feet with a total value of \$49.06.

Damages for timber cut in trespass will be assessed at a rate of triple the appraised stumpage price. Procedures for timber trespass investigation and reporting are described in 53 IAM Handbook 7, Forest Trespass.

3.3.3 Road

Road trespass occurs when someone constructs or reconstructs a road while involved in forestry related activities, across trust land without first receiving authorization or permission to do so. It is possible for this to occur because the checkerboard type of ownership found on the Reservation often leads to confusion over the exact location of property lines. Road trespass is almost always inadvertent.

The permanent nature of roads makes this type of trespass potentially more damaging to the affected forest resources than either timber or fire trespass. Road construction causes a loss of productive acreage and an increased likelihood of erosion and stream siltation. Also, the greater access afforded the general public to the trust lands increases the likelihood of wildfire and the introduction of noxious weeds.

In terms of road construction for timber sale compartments and forest development project areas, there shall be an active effort to minimize the amount of logging roads constructed and to ensure complete closure of roads following activity. These two goals will be achieved by completing at minimum the following:

- 1) Back-sloping the entire road area,
- 2) Reseeding the entire road site,
- 3) Covering the area with ponderosa pine slash.

The contractor or project manager shall be responsible for ensuring the road is inaccessible following the completion of the project within 30 days. Furthermore, there shall be minimization of the use of All Terrain Vehicles (ATV's) in the timber sale compartments and project areas by tribal and BIA forestry personnel and contractors.

3.4 Emergency Rehabilitation

All fires on the Northern Cheyenne Reservation will be evaluated for emergency stabilization and long term rehabilitation needs. Stabilization of suppression impacts is normally performed by the suppression organization, and funded under the suppression account (fire code). If the impacts from the fire are severe enough, a Burned Area Emergency Response (BAER) Plan will be prepared. This BAER Plan is for emergency stabilization needs and covers the period one year after control of the fire. Dependent on size of the Incident, the BAER Plan will either be prepared by a local agency team, a Regional BAER Team, or a National Interagency BAER Team. The Agency Superintendent can approve BAER Plans up to \$250,000 in cost. The Regional Director has approval authority up to \$500,000. The Fire Director at the National Interagency Fire Center (NIFC) in Boise, Idaho, has approval authority above \$500,000.

If longer term rehabilitation is needed, a Burned Area Rehabilitation (BAR) Plan will be

prepared. This Plan will cover rehabilitation needs up to three years after control of the fire. While not as tightly constrained as the BAER Plan, the BAR Plan may continue projects begun under BAER. Funding for the BAR program is allocated each year in a fixed account for the Department of the Interior Agencies, and subject to competition. The Interior BAER Coordinators prioritize expenditure of this funding on a yearly basis, so project funding is not guaranteed.

If restoration projects still exist or are needed after the three year period expires, then agencies must find local funding to complete or continue the projects.

Emergency rehabilitation of forested areas devastated by fire, insects, wind, or other natural forces will be addressed on an "as needed" basis. A Rehabilitation Plan will be developed immediately, and rehabilitation will commence as soon as possible. Priority will be given to soil and stream bank stabilization efforts, followed by timber salvage and reforestation. Requests for emergency rehabilitation assistance, including cost estimates of damage, will be expedited by the BIA Rocky Mountain Regional Office. Revisions of the Rehabilitation Plan may be implemented as periodic reviews are conducted.

3.5 Documentation, Monitoring & Records

Documentation and records for all fire suppression actions are maintained at the Northern Cheyenne Agency Fire Dispatch office. Records of insect and disease monitoring and control measures are maintained at the Northern Cheyenne Agency Forestry office and the Rocky Mountain Regional Forestry Office. Trespass investigation records are maintained at the Northern Cheyenne Agency Forestry office for cases of timber and road trespass and at the Northern Cheyenne Agency Fire Dispatch office for cases of fire trespass. Trespass documentation follows the procedures described in 53 IAM, Handbook 7.

3.6 Planning, Coordination, & Communication

Fire protection planning is described in the Northern Cheyenne Fire Management Plan. Fire protection is a community-wide effort with considerable interest among the public due to the substantial losses in forested areas due to wildfire since 1980.

Insect and disease control efforts are included in the standard operating procedures for all Northern Cheyenne Agency Forestry and Tribal Forestry employees. Signs of insect or disease activity are reported to the Forest Manager or the Tribal Forestry director by field staff who observe them. Appropriate response measures are formulated and implemented to control the outbreak before it becomes severe. Since 2000 there have been few outbreaks of insect or disease damage beyond that caused by normal endemic populations of harmful agents. This is likely the result of previous decades' efforts at converting the reservation forest from an unmanaged old-growth state to a more regulated condition.

Trespass detection and control measures are likewise a joint effort between BIA Forestry and Tribal Forestry. Detection efforts are part of standard operating procedures for all field staff. In cases of trespass the initial investigation is conducted by the BIA Branch of

Forestry including documentation of land ownership, volume, value, and forest resource damage. The authority and responsibility for criminal investigation and prosecution lies with Bureau and Tribal Law Enforcement personnel.

3.7 Organization & Funding

Timber sales and fire management are currently carried out by the BIA. Forest development activities are presently operated under a PL 93-638 Contract and are supervised by the Tribal Forestry Director. The Forest Manager is responsible for the daily operation of the Branch of Forestry.

The Branch of Forestry is organized according to the organization chart shown in Figure 5. The Forest manager reports directly to the Deputy Superintendent for Trust Services, who is in turn responsible to the Agency Superintendent. Current staffing consists of four foresters, three technicians, and one clerk. Tribal Forestry is served by a Director, four technicians, and one clerk.

The Fire Management Office maintains a fire cache that is capable of organizing, equipping, and dispatching up to four emergency fire fighting crews. The crews also conduct prescribed burns as needed.

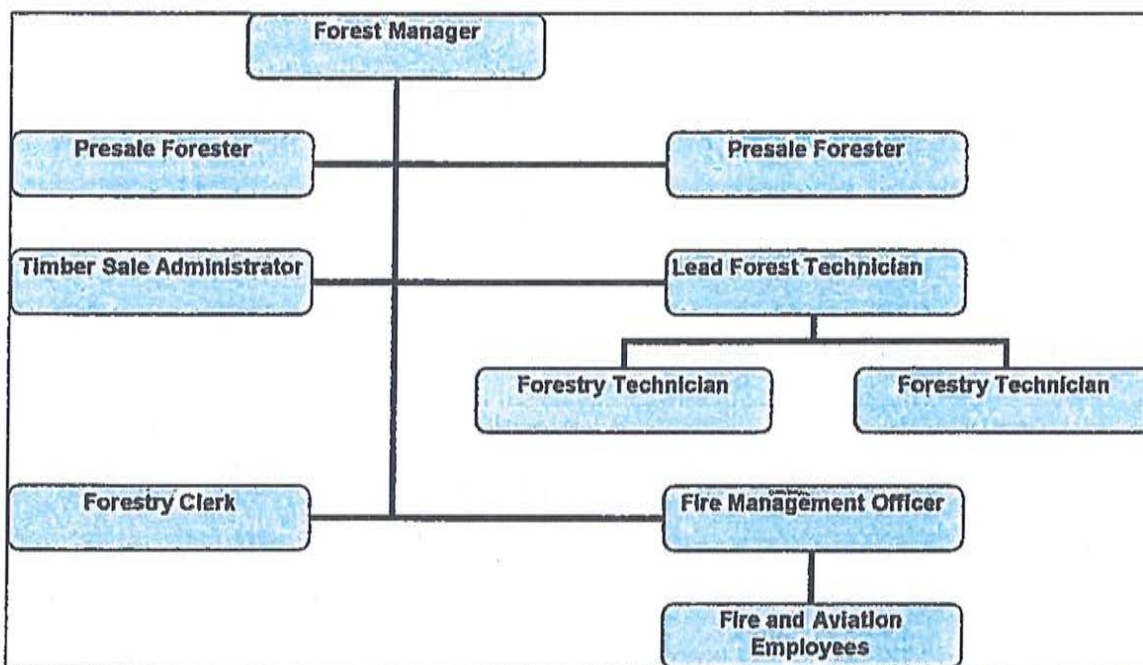


Figure 5. BIA Forestry Organizational Chart. Northern Cheyenne Agency, BIA Forestry and Fire Management Program.

The Branch of Forestry has historically been, and continues to be understaffed and under funded by any standard. As a result, the need exists for individuals from one department to assist in the activities of other departments on a regular basis. Full staffing is a necessary prerequisite to proper implementation of the Plan. In order to achieve the goal of a fully functional management plan, networking and coordinated efforts between the

BIA and the Northern Cheyenne Tribe is of critical importance. In the years to come, an integrated team approach involving BIA and Northern Cheyenne Tribe as well as specialists from outside agencies will be actively pursued in order to assure proper management of the Northern Cheyenne forest resource.

Current annual funding for the Branch of Forestry totals \$1,301,193. Timber Management is allocated \$542,390, Fire Preparedness \$574,255, Fuels Management \$136,948, and \$47,600 to Fire Prevention and Education. The primary sources for funding currently available are the regular Tribal Priority Allocation (TPA) funds and forest management monies deducted from timber sales receipts. Tribal Forest Development total budget FY2008 amounted \$1,545,362.33. The Tribal Forestry Program is supported by \$413,988.00 obtained from appropriated funds, non-reoccurring funds via PL93-638 contract with the Northern Cheyenne Agency. The remainder consists of carry-over from FY2007 and funding via the Memorandum of Agreement between the Tribe and the Rocky Mountain regional Office. The funds amounts associated with this MOA are dependant on planned activities and regional carry-over monies. Additional sources of funding that may be available for forest management activities include both general tribal funds and special non-recurring funds earmarked for forest development activities. Other possible sources of funding that would be program/project specific are listed below:

Two separate organizations, one BIA and one tribal, currently carry out forest management activities. The BIA Branch of Forestry is headed by a Forest Manager and staffed with two Presale Foresters, a Timber Sale Administrator, 3 Forest Technicians dedicated to timber sale preparation and administration, a Forestry Clerk, a Fire Management Officer (FMO), an Assistant FMO, a Fuels Specialist, an Operations Specialist, a Fire Prevention and Education Specialist, a Fire Staff Support Assistant, and numerous seasonal and emergency employees.

The Forest Manager is responsible for overall program coordination, which includes budgeting, staffing, and supervision of all facets of the forestry program. The Presale Foresters are responsible for logging unit layout, which includes silvicultural prescription writing, harvest unit layout, road location, inventory, and NEPA document preparation. The Timber Sale Administrator monitors all logging operations to ensure contract compliance and oversees the collection and distribution of stumpage payments. The Forest Technicians implement projects in the field as directed by the professional staff. The Forestry Clerk handles routine office administration, assists with maintaining timber money records books, and supports all aspects of branch management.

The Fire Management Officer has delegated responsibility for the fire suppression, fuels management, and fire prevention and education programs and is responsible for the training of seasonal firefighters. The roles and responsibilities of the FMO and the subordinate employees of the Fire and Aviation division are detailed in the Northern Cheyenne Fire Management Plan.

Current staffing will be needed to execute the forest management program specified in

this plan. Funding shortfalls resulting in the loss of staff will cause delays in meeting objectives on an annual basis and for the overall planning period. The BIA Branch of Forestry is funded through TPA of appropriated funds. At the current time funding levels are not high enough to support basic fixed costs of payroll and vehicle rental from General Services Administration at full staffing levels. Balanced budgets over the past several years have only been possible due to a high rate of personnel turnover and difficulty in recruiting employees to fill the professional positions.

The Tribal Forestry department operates under a PL 93-638 contract and PL93-638 Forestry Cooperative Agreement with the BIA. The department is staffed by a Program Director, a Secretary, and 4 Forest Technicians, and has responsibility for the reservation's forest development activities including reforestation and pre-commercial thinning. The program director serves as a liaison between the tribe and BIA. The other responsibilities of the tribal forestry program include: act as the tribe's representative/ liaison in all forestry activities, issues and concerns; conduct slash pile burning operations; issue free use timber cutting permits/loggers camping permits; conduct fuels management project activities and other forestry activities not covered through BIA PL 93-638 contract.

Forest Management deductions from the BIA, through Forest Management Deductions include 10% of timber sale deductions and other holdbacks from stumpage payments for cultural resource and noxious weed eradication needs.

CHAPTER 4. TIMBER MANAGEMENT IMPLEMENTATION PLAN

4.0 Forest-Wide Tribal Timber Management Standards

The Bureau of Indian Affairs is committed to the principles of sustained yield management, as required by 163 Subpart B 163.11, forest management planning and sustained yield management, of the General Forest Regulations in Title 25, Code of Federal Regulations. The Timber Use Policy Statement of the Northern Cheyenne Tribal Council is utilized by the Northern Cheyenne Agency for management of the Northern Cheyenne Reservation forest.

The following guidelines have been formulated to direct the management of the forest resource. These standards represent general guidelines that address most situations on the Northern Cheyenne Reservation. These guidelines tend to be general in nature and may, at times, need to be modified to suit site-specific situations, although in the majority of instances they should be followed.

- Protect Tribal and allotted forestland from insects, disease, trespass, and fire, primarily through prevention efforts. When necessary and feasible, initiate prompt and effective suppression of damaging agents.
- Bring the most productive areas of the forest under timber management.
- Utilize harvesting, thinning and prescribed burning to mimic the natural fire regime.
- Achieve optimum tree growth through thinning of sapling and pole stands.
- Perform harvesting so as to leave the residual stand in the best possible condition, allowing for prompt regeneration, and the development of growing stock at optimum levels of volume, spacing, and quality.
- Schedule the harvest of timber to remove diseased, damaged, and decadent trees as the first priority, where feasible.
- Plan harvest and site preparation treatments to minimize damage to or enhance long-term soil productivity through the use of appropriate logging practices, equipment, and timing.
- Employ an array of techniques in cutting unit layout so as to blend the harvested area with adjacent terrain features. The size of natural openings in the forest will be a factor in determining the scale or size of the cutting unit.

4.1 Silvicultural Guidelines

This section describes select silvicultural guidelines for different forest management zones and current site specific stand conditions. In each forest management zone, the long-term timber management goal will be achieved by the use of silvicultural tools to imitate the processes of nature

4.1.1 Forest Management Zones

The forested areas within the reservation are divided into 4 forest management zones: 1)

commercial timber zone; 2) noncommercial timber zone; 3) encroachment timber zone; and 4) special management zone. Each forest management zone has its specific silvicultural goals which are described below.

4.1.2 Commercial Timber Zone

The Commercial Timber Zone consists of those forested areas that are producing or are capable of producing timber at this time that is economically feasible to manage on a sustained yield basis. The silvicultural goals in the Commercial Timber Zone include the following.

- Attain the maximum potential tree growth of the site.
- Maintain or improve stand health by stocking control and salvaging damaged trees.
- Maintain or increase plant species diversity.
- Maintain or attain prescribed tree density as measured by basal area or number of trees per acre.
- Decrease the amount of mortality in the merchantable size classes by targeting for harvest recently dead or dying trees.
- Maintain nutrient cycling.
- Prevent timber and fire trespass.
- Mimic the effects of natural fire through timber harvesting and prescribed burning.

4.1.3 Noncommercial Timber Zone

The Noncommercial Timber zone consists of those forested areas that are not producing or are not capable of producing timber that is economically feasible to manage on a sustained yield basis. The silvicultural goals in the Noncommercial Timber Zone include the following.

- Protect the forest from fire, insects and disease.
- Use prescribed fire to mimic the effects of natural fire.
- Prevent fire and timber trespass.
- Maintain or increase plant species diversity.
- Include appropriate areas in logging units when adjacent to commercial forest areas.

4.1.4 Encroachment Timber Zone

The Encroachment Timber Zone consists of those areas that historically were grasslands but are now encroached upon by timber. The silvicultural objective in the Encroachment Timber Zone will be to return these areas to their natural state as grasslands. To accomplish this objective the number of trees in these areas will be reduced through mechanical treatments and the use of prescribed fire.

4.1.5 Special Management Zones

Special Management Zones consists of those forested areas with a special use

designation. Examples are visual corridors, critical wildlife habitat, campgrounds, cultural use areas, home sites, archaeological sites, residential areas and riparian areas. The timber stands in these areas will generally be allowed to develop in an unmanaged state. The silvicultural goals in Special Management Zones consist of the following.

- Maintain stand diversity.
- Maintain or improve stand health.
- Maintain or increase plant species diversity.

4.2 Silvicultural Systems

There are 87,452 acres of managed timberland within the Northern Cheyenne Reservation that is available of timber harvesting over the 15 year planning period. Of this managed timberland acreage, 69,773 acres are scheduled for harvest over the 15 planning period.

Ponderosa pine is the most common pine species in western North America, and is the only commercial forest type on the Northern Cheyenne Reservation. There are scattered areas of juniper and various hardwood species, but Ponderosa pine is the only merchantable species. It is intolerant of shade, but seedlings can grow, albeit slowly, under the canopy of an existing stand. Ponderosa pine reproduces best in openings created by fire or logging, but good seed years are irregular and unreliable. The best natural regeneration occurs when a good cone crop coincides with a wet summer. In these instances, overstocked stands often occur. If they are not thinned, they develop into spindly trees with poor crowns, many of which are bent over by wind or snow. The target stocking level for ponderosa pine at stand establishment is 350 stems per acre. The target stand at 20 years is 170 stem per acre, and it should be precommercially thinned if necessary to assure that level of stocking.

Because ponderosa pine does grow well in shade, a system of even-aged management is effective to assure that seedlings will receive adequate sunlight. Most pine stands are already in a more or less even-aged condition, which can be readily perpetuated by shelterwood or seed-tree cutting. Shelterwood systems involve leaving enough mature trees to produce seed and enough shade to protect the new seedlings from temperature extremes. A seedtree harvest leaves just a few trees, either singly or in groups, to provide seed but the seedlings are not protected to a significant degree. Leaving trees with the best available genetics, some beyond the targeted rotation age, as a seed source for the next stand should provide natural regeneration of superior seedlings. Not having to plant tree seedlings eliminates the concern of whether the seedlings are appropriate for the site and reduces the cost of establishing the new stand. The leave trees may be harvested after seedlings are established or left for the next rotation. Some would likely die and become wildlife trees, increasing biodiversity and creating habitat for birds and mammals. Planting of seedlings grown from cones collected locally is an option if the units do not regenerate successfully. Even-aged management would be most appropriate on north slopes and in draw bottoms, in stands with shrubby habitat types. These habitat types are Ponderosa pine/snowberry and Ponderosa pine/chokecherry (*Forest Habitat*

Types of the Crow and Cheyenne Indian Reservations, Cooper and Pfister, U.S.D.A. Forest Service, August 1984).

On south slopes and ridgetops, where dry sites are common, ponderosa pine tends to form more uneven-aged stands. These stands usually have a grassy habitat type. These habitat types are ponderosa pine/bluebunch wheatgrass, Ponderosa pine/Idaho fescue, and ponderosa pine/bitterbrush. Selection cutting would be used to perpetuate the uneven-aged nature of these stands. Single tree selection removes individual trees throughout the stand to promote growth of the remaining trees and make room for regeneration. Group selection removes small groups of trees. Both methods provide a seed source and protection for the seedlings.

Silvicultural methods will be designed to appropriately treat a variety of existing stand conditions. Timber markers will be trained to identify general stand conditions and micro-sites so that marking techniques vary between even- and uneven-aged silvicultural goals.

Adequate site preparation is essential for natural regeneration of ponderosa pine. From a cost and biological perspective, prescribed fire would be the best site preparation method. It would reduce the fire hazard, remove duff to expose mineral soil, release nutrients, and create micro sites with desirable conditions for seedling establishment. Burning prescriptions which allow hand crews to control the fire would meet the objectives. If prescribed fire is not appropriate because of ownership patterns, staff size or experience, mechanical scarification would be appropriate. Generally, ground-based skidding does not expose the 50-60% of bare soil that is desirable for pine regeneration, so additional scarification may be required.

In some cases it may be appropriate to lop and scatter the slash. Slash created from July through December does not provide attractive breeding sites for Ips pine engraver beetles. Slash left on site is beneficial for nutrient cycling and soil protection. However, Ponderosa pine trees often have too many large limbs, and may produce more slash than can be lopped and scattered adequately to mitigate the fire hazard. Where logging slash accumulation from lopping and scattering would be excessive, whole tree skidding to log landings would be required. Most modern mechanical logging equipment is designed to perform whole tree skidding."

These silvicultural goals will be met through the following methods.

Clearcutting. A one step entry that completely removes the existing stand. New seedlings are from planted stock or from natural seeds that fall from existing nearby trees. This system may be used to regenerate stands that are too decrepit to produce a viable cone crop. It is expected that the use of this system will be minor.

Seed Tree. A two step system that removes all but 10 to 15 trees per acre. The residual trees provide seed to start the new stand and then are removed when the seedlings are established and past the fire vulnerability stage. This will be the most frequently used

method for regenerating north-facing aspects.

Shelterwood. A two or three step system that leaves a greater number of trees per acre than a seed tree cut. The greater number of trees provides more shade for seedlings and more protection from wind damage to the residual stand. This system will be used on exposed ridges and dryer south slopes. The residual trees are removed after seedlings are established.

Overstory Removal. A harvest that completely removes the older, larger overstory trees in an area where advanced regeneration already exists in quantity and quality to become a viable future stand. This is similar to removing the residual trees in a seed tree or shelterwood cut when the new seedlings are established on the site. This is a viable prescription in many situations where an old growth stand has become decrepit and is breaking up.

Precommercial Thinning. Thinning is the cutting of some trees to allow the remaining trees to reach merchantable size by providing adequate space and resources to grow. Controlling tree density will be timed after the most vigorous trees have expressed dominance and before the growth rate slows down from competition.

The healthiest and best-formed trees are selected as crop or leave trees. Suppressed, diseased, and damaged trees are targeted for cutting. Slash is lopped into small pieces and scattered. Thinning program will be limited to the months of August through January in order to minimize the impact of pine engraver beetle (*Ips pini*) on residual trees.

Current thinning guidelines recommend thinning stands to a 16 foot spacing, which leaves 170 crop trees per acre. The thinning of overcrowded stands is currently a reservation-wide priority and a focus of Tribal Forestry's forest development program. All thinning work will be supervised by the Tribal Forestry Director and accomplished by tribal contractors. The stand types targeted for thinning are as follows.

- Ten to fifteen year old sapling stands now at the onset of crown closure.
- Healthy pole stands less than 40 years old, now crowded and yet having enough live crown to quickly respond after thinning.
- Dense understories in recently harvested stands, scheduled for thinning immediately after the completion of the timber harvest.

Commercial Thin. This type of thin is accomplished in a stand that is overstocked with larger diameter trees of some commercial value. Trees that are cut are removed and sold for stumpage. This type of thin should not be used unless there are enough viable trees, i.e. of good form and vigor, remaining per acre to fully capture the growth potential of that site. This entry is usually at a midpoint between the precommercial thin and the final harvest (regeneration cut). This would generally be at age 45 to 55 on the reservation.

Salvage. Salvage cutting is done to recover value from trees that are recently dead or

dying. Salvage cutting generally targets trees that have been killed or damaged by insects, fire, hail, wind, or other damaging agents.

4.2.1 Tree Marking Guidelines

Ordinarily only the merchantable size trees will be leave tree marked unless good quality advance regeneration is specifically identified to be protected from felling trees, or trees to be cut can be marked if this is more efficient. Either cut or leave trees can be marked, depending on which is more efficient. If the stand requires the same amount of paint for either type of mark, leave tree marking will be preferred because of the advantage of focusing the attention of the timber marker on the residual growing stock.

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. The long-term objective is to maintain the unevenaged character of these stands, to increase tree vigor, and to reduce susceptibility to damage from insects, diseases, wind and fire.

Crop trees will be selected according to position in the crown canopy, crown size, tree age or size, quality, vigor, form, and spacing between other trees. Keen's Classification for interior ponderosa pine is a helpful tool for keying in on a tree's vigor because it focuses on two major factors, tree age and crown vigor. This classification is suitable for selecting trees for cutting when risk of beetle attack is the main consideration because vulnerability to loss from beetles is closely related to the tree's growth rate. Usually the crop tree density will be seven to eight trees 3 inches DBH or greater for each tenth acre area.

Other considerations for marking are severely leaning trees, dead or multiple tops, forks below the top of the first log, visible defects, crooked boles, trees in skid trails, and trees in the way of felling other trees.

All harvest units on Tribal Original lands will be marked with blue paint. Allotment harvest units will be marked with red, orange, yellow, or white paint. Exclusion areas will be marked with green paint. Leave trees will be designated by painting a ring around the tree at breast height and a second mark on the downhill side of the tree from the ground line to stump height. Cut trees will be marked with diagonal slashes at breast height and a stump mark. Cutting unit boundaries will be marked with blue flagging or double-ringed trees.

4.2.2 Site Preparation.

Site preparation, an integral part of any harvest cutting, prepares the ground for natural regeneration or the planting of seedlings. This is done either as part of harvest operations in conjunction with slash piling, or mechanical treatment and prescribed fire as soon as possible after harvesting is completed. The goal is scarification to expose mineral soil to

seed fall. Site preparation will be accomplished by machine scarification or by prescribed fire. Rubber-tired skidders with brush blades are commonly used to pile slash and scarify the site.

4.2.3 Regeneration.

Whenever possible, natural regeneration will be used to re-stock stands after timber harvest. This method maintains proven genetic material for crop trees on the site. Selection cutting followed by low intensity ground fire recycles nutrients bound in woody debris. This stimulates residual trees to produce a viable cone crop. This is important because ponderosa pine trees typically produce one good cone crop in a ten year period. Planting, however, will be used extensively in the event that harvested stands do not adequately restock. Stocking guidelines for eastern Montana ponderosa pine stands recommend from 250 to 300 well-spaced seedlings per acre within five years of harvest.

4.3 Harvest Schedule

The harvest schedule listed in Table 1 on the following pages represents the upcoming timber harvest as planned at the time this plan was written. Individual compartments are listed and arranged by priority for receiving silvicultural treatment. These compartments may be combined to form larger logging units or split up into smaller logging units.

The harvest schedule will be reviewed annually by the Tribe and the BIA and modified as needed. Reasons for modification include the need to quickly salvage storm damaged or fire killed timber, inability to access forested areas across allotted lands, or the failure of previously prepared logging units to sell due to poor market conditions. Proposed sales will be rescheduled.

Appendix D contains maps of the Reservation Management Units (RMU) and all of the compartments within each RMU. The compartment maps show the paved roads, compartment boundaries, and acres of commercial timber.

Table 3. Timber Harvest Schedule. Planned timber sales to be advertised from 2009-2023 by BIA-Forestry.

Year	Compartment Number	Compartment Name	Compartment Acres	Compartment Volume
2009	2-03	St. Johns	3280.8	4.9
2009	3-02	Ridge Walker	851.0	1.3
2009	5-03	Eagle Feathers	685.0	1.0
2009	5-06	Thompson Creek	2553.4	3.8
2010	1-01	Bigback	631.1	0.9
2010	1-02	Yellowfox	1426.3	2.1
2010	1-04	Sawmill	1281.4	1.9
2010	2-18	Moreland	2543.8	3.8
2011	1-34	Bull Snake	791.9	1.2

2011	1-35	Alderson Creek	755.9	1.1
2011	3-03	Buster	1530.1	2.3
2011	3-15	Juddy Creek	1106.6	1.7
2011	5-13	Kirby	645.3	1.0
2012	1-30	Coal Creek	1474.1	2.2
2012	5-14	Dry Creek	2065.7	3.1
2013	1-05	Whiteman	1265.4	1.9
2013	1-29	Burns	967.7	1.5
2013	1-46	Hollowood	2071.8	3.1
2014	1-32	White Buffalo	1803.7	2.7
2014	1-33	Horn Creek	1257.6	1.9
2014	1-51	Brady	366.1	0.5
2014	3-21	Bixby Ranch	1285.4	1.9
2015	5-10	Small, Trail Creek	2425.7	3.6
2015	5-12	Skunk Creek	1472.6	2.2
2016	1-27	Soldier Gulch	1114.4	1.7
2016	3-04	Powell Creek	904.1	1.4
2016	3-05	Shavehead Creek	298.4	0.4
2016	3-16	Sweet Medicine	1052.4	1.6
2016	3-17	Black Canyon	865.1	1.3
2016	3-19	Church Creek	772.6	1.2
2017	5-07	Busby Creek	1613.0	2.4
2017	5-08	Birdseye Spring	986.7	1.5
2018	3-13	Lame Deer	1304.1	2.0
2018	3-18	Calls First	813.4	1.2
2018	3-20	Longjaw Creek	2057.7	3.1
2019	1-21	South Stebbins	1143.4	1.7
2019	1-22	Walking Horse	611.4	0.9
2019	1-47	Cowboy	1393.0	2.1
2019	2-16	Pawnee Creek	2933.5	4.4
2020	2-05	Canyon Spring	1839.0	2.8
2020	2-06	Beaver Heart Spring	595.8	0.9
2020	2-07	Elliot Spring	839.0	1.3
2020	2-09	Clubfoot Creek	1353.4	2.0
2020	4-13	Jimtown	1060.6	1.6
2021	1-44	Logging Creek	491.6	0.7
2021	5-04	Getaway	471.1	0.7
2021	5-05	Dahle	625.5	0.9
2022	1-38	Leroy	929.4	1.4
2022	2-08	Lost leg	1676.5	2.5
2022	2-11	Tie Creek	1127.3	1.7
2022	2-13	Juniper	1026.4	1.5
2023	1-31	Broken Jaw	1273.0	1.9
2023	2-12	Longroach	3184.9	4.8
2023	5-09	Pine Creek	877.4	1.3

4.3.1 Scheduled sales (1-2 years)

The Branch of Forestry has several logging units in various states of preparation. These units will be advertised in the first years of this plan.

The St. John logging unit was previously offered for sale in 2006 and again in 2007 but attracted no bidders. This logging unit is comprised of timbered areas in compartments 2-02 (Cook Creek) and 2-03 (St. John's). The timber cruise and appraisal of this unit will be updated prior to re-advertisement.

The Eagle Feathers logging unit was in the final stages of preparation at the time this plan was completed. This logging unit is comprised of timbered areas in compartments 5-03 (Eagle Feathers) and 5-06 (Thompson Creek).

The Moreland logging unit was previously sold in 2006. No timber had been harvested from the unit when the contract expired in 2008 and the purchaser was found in default of the contract terms. This logging unit is comprised of timbered areas in compartment 2-18 (Moreland).

The Yellowfox logging unit was in the final stages of preparation in 2007 but was never finalized.

4.3.2 Planned sales (2-5 years)

There should be serious consideration in these years of completing the harvest cycle through all of the forested compartments, rather than leaving out some that have never seen a treatment. There are still some compartments out there that have never been entered. The focus of the timber sale program during this part of the planning period is to revisit compartments that have previously received forest management treatment. This plan was written to emphasize second entry treatments and to follow up on previously treated stands so as not to lose the benefit of earlier management activity.

4.3.3 Projected sales (6+years out)

The remainder of the proposed harvest schedule continues the focus on returning to previously treated areas to maintain silvicultural gains from earlier management action. Movement into previously unmanaged areas or into areas that have been managed previously but have reverted to an unmanaged condition is given lower priority. The long-term goal of the timber harvest program is to bring all commercially forested acreage under sustained yield management.

4.4 Harvest Policy & Indicated Annual Cut and Annual Allowable Cut

A report of the inventory analysis from the 2004-2005 Continuous Forest Inventory re-measurement is available at the Tribal and BIA Forestry departments. The Indicated Annual Cut was calculated in the analysis as being 6.9 MMBF per year. The Northern

Cheyenne Tribal Council has set the Annual Allowable Cut to be equal to the Indicated Allowable Cut.

4.4.1 Best Management Practices

In 2003 the Northern Cheyenne Tribe developed a comprehensive set of Best Management Practices for forestry operations on the reservation. These are included in Appendix D. These BMPs will be utilized to guide timber sale layout and harvest operations during the planning period. These BMPs have been copied from the Tribal non-point source management plan, hence the appendix page numbers are 31-51.

4.4.2 Noxious Weed Control

Noxious weeds management will primarily consist of preventing the spread of noxious weeds from forest management activities. All equipment and vehicles used in the conduct of forest management activities should be power washed, especially throughout the under carriage and wheels/tracks. The purpose of this washing is to remove all soil and noxious weed seed and plant parts before entering the forested area. Vehicles and equipment should also be power washed at the completion of the forest management activities to prevent any noxious weed seed encountered on-site from being moved to an un-infested site.

Noxious weeds or patches of noxious weeds located within a forest management activity area should be avoided, if possible. Driving of equipment or vehicles or skidding of logs through weed infested areas should be avoided. Areas of noxious weeds should be noted and treated, preferably before activities begin. Any disturbed areas within a forest management activity area should be reseeded to native species acceptable for that site. Disturbed areas radiating from known noxious weed patches should be monitored for two to three years with noxious weed treatment occurring as needed. All forest roads used for forest management activities should also be monitored for two to three years after activity closure. Any treatment needs should be referred to the agency noxious weed coordinator.

4.4.3 Authorities

Timber harvest is permitted under 25 USC and the Code of Federal Regulations, Title 25, Part 163, General Forestry Regulations. The Northern Cheyenne Tribe has passed a Timber Policy Statement under Tribal Resolution No. 116 (90) to guide the development and administration of timber sale projects.

4.5 Forest Development

The Forest Development Schedule for pre-commercial thinning is logged areas of Timber Sales units listed by year as planned. This schedule will be reviewed annually by the tribe and BIA, and modified as needed. Modifications may range from funding levels, weather and wildland fire. 15 year total equals 15,000 acres.

Table 4. Forest Development Schedule. Planned Thinning projects from 2009-2023 by Tribal Forestry, PL 93-638.

Year	Unit Name	Estimated Acres
2009	Black Springs	1000
2010	Broken Jaw	430
2010	Pawnee	300
2010	Black Springs	270
2011	Head to Head	200
2011	Pawnee	500
2011	Black Springs	300
2012	Pawnee	440
2012	Head to Head	200
2012	Black Springs	360
2013	Clubfoot	500
2013	Clack Springs	500
2014	Kelty Creek	425
2014	Black Springs	500
2014	Baby Dean	75
2015	Black Springs	1000
2016	Clubfoot	730
2016	Black Springs	70
2016	Pawnee	200
2017	Buffalo Pasture	400
2017	Clubfoot	600
2018	Lost Leg	1000
2019	Clubfoot	340
2019	Black Eagle	660
2020	Black Eagle	1000
2021	Black Eagle	440
2021	St. Johns	560
2022	St. Johns	1000
2023	St. Johns	1000

4.5.1 Reforestation (species manipulation, forestation, etc.)

Stocking surveys will be the basis for determining reforestation needs. Currently there is a backlog of 18,622 acres. A site will be considered stocked if it has 300+ trees per acre. Sites with less than 300 trees per acre will be evaluated on a site-by-site basis. Sites with no available seed source will be given priority. Sites will be planted on spacing prescriptions dependent on the productivity of the particular site. Planting will be done by tribal employees, tribal contractors or a combination of both. Preference will be given to tribal members where possible. Seed for growing stock will be collected from the

reservation, from trees showing superior genetics and/ or resistance to disease. In the event seed is not available, seed from adjacent forests will be used.

The schedule is listed by fire name. This schedule will be reviewed annually by the Tribe and BIA, and modified as needed. Modifications may range from funding levels, weather and wildland fire. Fifteen year total equals 18,622 acres.

Table 5. Tribal Forestry Reforestation Schedule.

Year	Unit Name	Estimated Acres	Estimated Stocking Survey Acres
2009	Early Bird/LittleHawk	2152	2000
2010	Early Bird/Baby Dean	1656	2000
2011	LittleHawk Baby Dean	1656	2000
2012	LittleHawk/Sioux	1102	2000
2013	Small/EarlyBird	1096	2000
2014	Jerry/Jimtown	1096	2000
2015	Craig II/Lulu	1096	2000
2016	Air Patrol/Slick	1096	2000
2017	Craig II/Crazyhead	1096	2000
2018	Air Patrol/Slick	1096	2000
2019	Baby Dean/Early Bird	1096	2000
2020	LittleHawk/Craig II	1096	2000
2021	Air Patrol/Slick	1096	2000
2022	Baby Dean/Early Bird	1096	2000
2023	Craig II/LittleHawk	1096	2000

4.5.2 Thinning (non-commercial, subsistence free-use)

Ponderosa pine stands are susceptible to overstocking and stagnation causing reduction of useable volume growth and increased susceptibility to insect and disease attack. There is currently a backlog of 69,200 acres in need of thinning. The most productive sites will be given priority in scheduling. Most stands will be thinned to approximately 170 stems per acre (16" x 16" spacing). Thinning will be accomplished by agency, tribal or contract personnel. All noncommercial thinning will be completed between July 1st of the current year and January 31st of the following year and at times designated by BIA on recommendations from research on the pine engraver beetle.

4.6 Data Collection

The Northern Cheyenne Agency is on the standard BIA fifteen-year forest management planning cycle. The current inventory completed in 2005 covers approximately 115,000 of the 155,066 acres of Northern Cheyenne forested land. The forest inventory in the

Northern Cheyenne forest is based on fixed plots located on a systematic grid. The inventory design is described in the Forest Inventory Analysis. Each plot pair represents approximately 320 acres of the surrounding forest. The inventory contained 715 plots, with every plot a permanent fixed radius plot. All trees (live and dead) with a 5 inch or larger diameter at breast height (DBH) and determined to be "in" the plot radius were measured and recorded. All live hardwood species of sapling size are also tallied on this plot. Output of the Continuous Forest Inventory (CFI) was designed to produce forest-wide estimates of species composition, volume and growth, documented in the Forest Inventory Analysis for the Northern Cheyenne Reservation Montana, December 2007. The current forest planning efforts are based on the CFI which was completed in 2005. Previous CFIs were conducted in 1974, 1983 and 1994. The CFI is designed to track the forest over time, providing an accurate representation of timber volume, cutting, growth, mortality, from one decade to the next. This provides unbiased estimates of stand and tree attributes.

Field staff visited each of the 715 permanent CFI plots and measured a series of stand and tree data which included, amongst other items: elevation, latitude, longitude, slope, aspect, habitat type, cover type, age, radial growth, diameter, height, species, crown ratio, crown class, defect and damage. For the first time, the 2005 CFI also included measurements of the forest fuel characteristics at each site. For further information on the design and implementation of the CFI, see CFI Field Manual Rocky Mountain Region Reservations, 2004.

The raw CFI data was statistically analyzed to produce forest-wide estimates of species composition, volume and growth. These estimates were used to estimate an indicated annual allowable cut for planning purposes. For further information, see Forest Inventory Analysis for the Northern Cheyenne Reservation Montana, December 2007.

4.7 Documentation, Monitoring & Records

Documentation and records for all timber sales and BIA commercial contract permits are kept at the Northern Cheyenne Agency, Branch of Forestry. Documentation of forest development activities is maintained by the Northern Cheyenne Tribal Forestry department and stored at that program's offices including free-use permits. This documentation is summarized quarterly and annually in forest development and timber sale reports and sent to the Rocky Mountain Regional Office (RMRO). The RMRO also compiles these reports into the Government Performance Results Act (GPRA) Report for the Central Office. This report tracks accomplishments.

4.8 Planning, Tactical Coordination, and Communication

The BIA Forest Manager has primary responsibility for monitoring the adequacy of the forest management plan. The Forest Manager is also responsible for maintaining sufficient lines of communication with the tribe through regular meetings with the Tribal Forestry Director. The Forest Manager and the Tribal Forestry Director should meet formally on a monthly basis to discuss the status of different forest management activities

and to consider changes to management activity that may be needed to improve the efficiency of operations or respond to unforeseen circumstances. If possible, the Fire Management Officer should also participate in these meetings to detail fire suppression activities and fuels management projects. During an active fire season it may be required to meet on a weekly or even daily basis. The minutes of these meetings will be provided to the Agency Superintendent and the Tribal Council to keep these entities apprised of changes in forest management practices.

4.8.1 Resource Management Interdisciplinary Team

Because forest management activities ultimately have an effect on various other resources, an interdisciplinary team approach will be taken during project planning to address the effects of forest management activities on other resources and to mitigate any potential negative impacts. In order to be effective, the Resource Management Interdisciplinary Team (RMIT) needs to be involved early in the planning process and responsibilities need to be as clearly defined as possible. Team members need to be committed and ready to make recommendations to mitigate potential adverse impacts to the various resources. Additionally, the management agency must be willing to make the recommended changes in proposed activities to assure minimal adverse impacts to the environment. The team should consider potential impacts to water quality, air quality, wildlife, rangelands, cultural sites, and other resources. While this plan describes RMIT involvement in forestry activities, the team can be applied to consider management activities of any discipline involving the management of natural resources and in the development of an Integrated Resource Management Plan for the reservation.

Team members should include appropriate personnel from the Natural Resources Department, Tribal Historic Preservation Office, BIA Branch of Forestry, BIA Range Department, and other interests to assure input is received on protecting valuable resources. The core team members shall consist of the following.

- Tribal Forestry Director
- BIA Forest Manager
- Tribal Natural Resources Director
- Tribal Historic Preservation Officer

The core team is supported by resource specialists including but not limited to the following.

- BIA Range Manager
- BIA Fuels Specialist
- Tribal Air Quality Coordinator
- Tribal Water Quality Specialists

The interdisciplinary team will be involved in all phases of forest management planning. Among other things, the RMIT will be responsible for the following.

- Identifying measurable issues and concerns related to the development of Environmental Assessments and plans for forest management activities.
- Recommending actions and reporting conflicts, technical changes, and other matters affecting all draft project plans to the Northern Cheyenne Tribal Natural Resource Board.
- Reviewing and assessing the results of timber sale activities.
- Developing and reviewing recommendations for amendments to the Tribal Best Management Practices and Standards.
- Developing and reviewing recommendations for amendments to the Forest Management Plan as necessary.
- Ensuring compliance with the guidelines set forth in the Forest Management Plan and other applicable federal and tribal laws and ordinances.

Timber sales will be reviewed by the RMIT as follows. Initially, RMIT members will be provided with a packet that includes a map of the project area including proposed road construction and unit boundaries. The RMIT will then have 14 days to review the documentation, conduct individual site inspections and prepare their comments and concerns. As soon as possible thereafter the RMIT will meet with the project's principal coordinator to discuss needed modifications to the proposed project.

After the first meeting the project will be set up to address the recommendations of the RMIT. Project documents will be provided to the RMIT members upon completion of project layout. The proposed management action will not proceed until the project documentation has been signed by the core RMIT members.

RMIT members must either attend the meeting to raise any comments or concerns then, or else submit their comments or concerns in writing prior to the meeting. If input is not received from a team member prior to or during the team meeting, it will be assumed that the team member has no comments or concerns on the proposed action. The goal of this process is to reach a consensus among the RMIT members on how to implement a proposed action while assuring minimal impacts to the environment.

A formal evaluation of the effectiveness of the forest management plan will occur in January of each year during the planning period. The RMIT will meet to consider the previous year's management activity and accomplishments will be evaluated and a plan of action for management activities in the coming year will be developed. In addition, any changes to the forest management plan due to changes in operating conditions, organizational structure, or forest management goals and objectives will be considered and the forest management plan formally appended. A report of this meeting will be presented to the Northern Cheyenne Agency Superintendent and to the Northern Cheyenne Tribal Council for their review.

The Forest Manager will also keep abreast of projects planned by other departments or programs which may affect the forest resource. Coordination of activities and sharing of costs will happen whenever possible.

The Northern Cheyenne Tribe and allottees, as appropriate, will be informed in writing, of planned forestry activities prior to the commencement of the activities. For allottees this will be done when requesting permission to conduct an activity and when obtaining powers-of-attorney. All timber sales and other major activities on Tribal forest lands must also be approved by the Tribal President or his or her designated representative.

4.9 Timber Market Trend

The ten year period from 1999 to 2008 saw a steady decline in value of timber and a reduction in the number of sawmills in the interior west. This culminated in a near complete closure of forest products markets toward the end of 2008 that coincided with the global economy going into recession.

Prices for ponderosa pine timber in southeastern Montana were stable through the first half of the period. In 2006 stumpage prices began a decline that accelerated over the next two years.

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. This left the sawmill operated by Neimann Enterprises in Hulett, Wyoming as 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.

As noted above, sawmill closures have increased the distance from harvest areas on the reservation to the mills where the logs are processed. This 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. Timber revenue for the Northern Cheyenne reservation beneficiaries including the tribe and allottees from Fiscal Years 2004-2008 have been provided in Figure 6.

The demand for forest products is strongly influenced by the housing industry. The economic recession that began in December 2007 is forecast to ease late in 2009 and to resume steady growth through 2020. The outlook for the housing market is that the easing of the overall recession will result in a resumption of steady growth in the housing industry.

Timber Harvest Revenue Fiscal Years 2004-2008

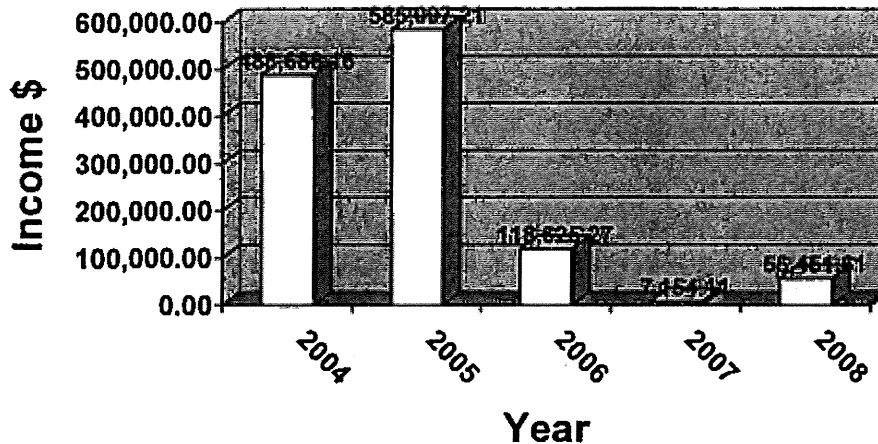


Figure 7. Timber Revenue, Northern Cheyenne Reservation. Revenue generated from Timber Sales reflects total amount collected for all trust land beneficiaries including tribal and allotted tracts. 2004 and 2005 were the result of salvage timber sales in areas impacted by wild-land fires.

While the long-term outlook indicates that demand for forest products will increase during the planning period, the severe economic downturn at the start of the period will have effects for years to come. The closure of numerous sawmills throughout the interior west has resulted in long haul distances from the reservation to sawmills purchasing reservation timber. This reduces the value of timber harvested due to the higher cost of shipping. 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 due to long haul distances and high fuel costs. In addition, the survival during the economic downturn of those sawmills and other forest products markets is not guaranteed. While some half-dozen sawmills could have been considered potential timber purchasers during the previous planning period, this number has already declined and will likely change further before the timber market recovers. Economic recovery is predicted to positively affect the timber industry by 2011. The beginning of this rebound might be seen in Figure 6, wherein following a precipitous fall in revenue from \$585,000 in FY2005 to \$7,000 in FY2007, there was an increase in revenue to \$56,000 in FY2008. The Agency and Tribe remain cautiously optimistic that this signifies the beginnings of a renewed timber market for the Northern Cheyenne Reservation.

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