



Chistochina

Community Wildfire Protection Plan

Prepared by Scott Yeats and Jonathan Haufler
Ecosystem Management Research Institute
And Jeffrey Hermanns Forest Solutions
Edited by Jason Hoke, Ahtna Inter-Tribal Resource Commission (AITRC)

October 2017

Photo Credit: Jennifer Myslivy, National Park Service

CONTENTS

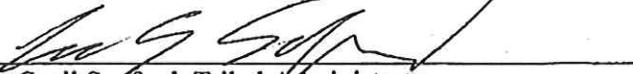
Executive Summary	3
Chistochina Risk Assessment	4
Collaboration	6
Chistochina CWPP Planning Area	7
Community Profile	7
Community of Chistochina	7
WUI Boundary	8
Population	8
Critical Facilities	10
Chistochina Summarized Risk Assessment	10
Chistochina Action Plan	13
Prioritized Tasks and Matrix of Mitigation Measures	13
Appendix A – Detailed Treatment Maps	19
High and Moderate Risk Fuels	24
Appendix B – Copper River Valley Historical Fire Information: 2012-2017	25
Structure Densities and Evacuation Routes	28
Wildland-Urban Interface	28
Cumulative Effects – Final Risk Assessment	30
Water Quality and Watersheds	30
Air Quality	30

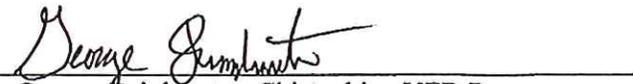
Chistochina Community Wildfire Preparedness Plan

Signature Page

This Community Wildfire Preparedness Plan was created and approved for the Chistochina Community and Cheesh'Na Tribal Council. It has been vetted by the local governing body of Cheesh'Na Tribal Council, the Community of Chistochina, the local fire department and the Division of Forestry-Tazlina, Acting FMO.

This Plan has been reviewed and approved by the following:

1. X 
Cecil Sanford, Tribal Administrator Date: 3-19-18

2. X 
George Drinkwater, Chistochina VFD Rep. Date: 3/19/18

3. X 
Derek Nellis, ~~Regional~~ Forester
Area, Div. of Forestry-Tazlina Date: 5/31/18



Figure ES-1 XXXXX. Photo Credit: T. Cambell.

Executive Summary

The Chistochina Community Wildfire Protection Plan (Chistochina CWPP) is a collaborative effort between Cheesh'Na Tribal Council, Ahtna, AITRC, the State of Alaska DNR Forestry, BLM and the National Park Service. This CWPP attempts to fully understand the risk of wildfire on the Chistochina community and appropriately mitigate future wildfire hazards. In order to accomplish this, a thorough analysis and risk assessment was conducted regarding Chistochina's village values, current and future community development, and surrounding land use. This Chistochina CWPP will:

- Assess the risk posed by wildfire to the community of Chistochina;
- Identify local values of concern;
- Identify local fire protection response and capabilities as well as natural and man-made barriers; and
- Develop mitigation measures designed to protect identified values from the threat of wildfire.

Chistochina is vulnerable to catastrophic wildfire due to a nearly uninterrupted timber stand of white and black spruce that encompasses the entire community. Frequent thunderstorms and associated lightning strikes in and around the community are a constant cause for wildfire concern during the peak lightning season in May, June and July. An even greater threat is posed by human-caused fires in the

local area. However, wildfire destruction is preventable if the correct protective steps are taken. After the CWPP Risk Assessment and the corresponding tasks are put into effect, mitigating wildfire risk can begin in a cohesive, focused and prioritized manner.

Chistochina Risk Assessment

The following is a summarized risk assessment list of highest to lowest risk for the Village of Chistochina. Further information on risk assessment can be located in the body of this CWPP.

- 1. Lack of Defensible Space for many private homes and structures and public homes and structures.** This is twofold, first is the hazardous forest fuels in close proximity to the home that threatens the survival of the home. Second is the large amount of abandon or dead vehicles, snow machines, construction materials and other type debris with many homes. This is a large threat to the survival of the home when on fire, it is also very toxic and very hazardous to the responding firefighters and residents. This can immensely hinder the firefighting efforts and make the job of defending the home almost impossible do to the severe danger in an emergency situation. A specific defensible space recommendation given the fuels and situation is shown in this plan.
- 2. Insufficient clearing for egress and ingress on most roads including the Glenn Highway.** These roads would not be open for travel including evacuation during a wildfire. This also could block off response from wildfire response by engines, tenders and personnel.
- 3. No community safety zone with shelter.** The community center is located with hazardous forest fuels adjacent to the structure and should not be considered to be a safety zone or a safe evacuation location during a significant wildfire event in Chistochina.
- 4. Communication tower not safe from a wildfire.** Hazardous forest fuels surround the communication tower and guy lines. The tower would likely not survive a wildfire resulting in a loss of communication at the very time when it's most important to the residents and emergency responders.
- 5. Electricity lines and infrastructure could be lost very soon after a significant wildfire event begins due to the volume and proximity of hazardous forest fuels.** (Alaska Power and Telephone (APT) cuts power as soon as lines are threatened to provide safety for the system and emergency responders.) The result is no power to home and a loss of any ability to use well water from loss of power to the pump. Few homeowners have any backup power generators. Near total loss of electrical lines and poles which could result in loss of power for weeks.
- 6. Little to no firefighting equipment and personnel in the village for initial response to a wildfire.** The Gakona VFD responds to the IA for Chistochina in 1 hour. The response time for engines and personnel from Glennallen is 90 min. minutes if they are available and not on another fire response. During conditions of high fire danger if the response is not timely and

effective the fire could quickly grow with little hope of containment before significant destruction would occur.

7. No evacuation and emergency response plan for a large fire in or adjacent to the village.
8. The volume and congestion of hazardous forest fuels throughout and immediately surrounding the village. The congestion of continuous heavy to extreme fuel loading could result in extreme fire behavior and the loss of the majority of homes and structures and values in the village.
9. The volume and congestion of hazardous forest fuels within ½ mile of the village with no break in the fuels before the village.

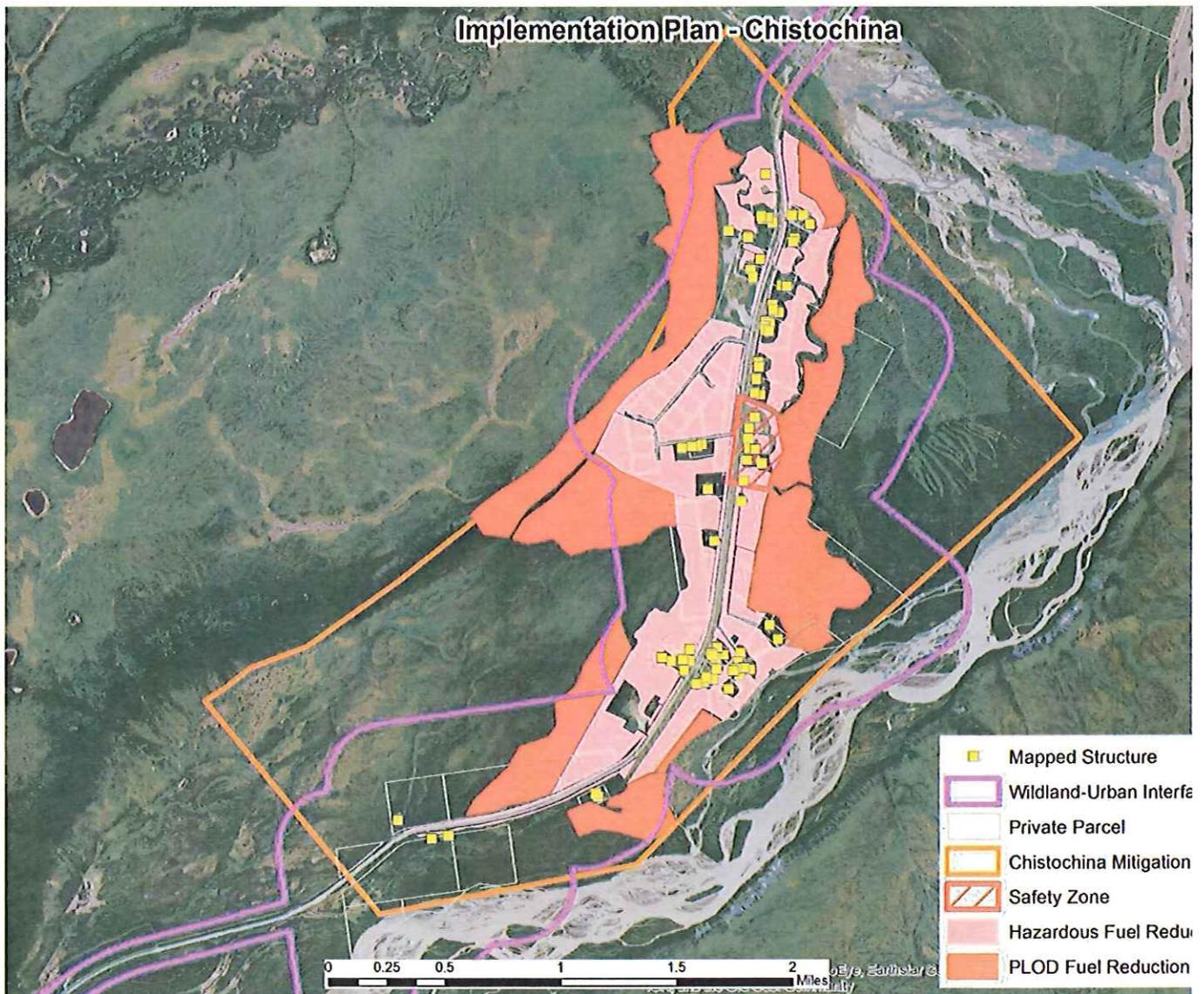


Figure ES-2. Implementation Plan for Fuels Mitigation surrounding Chistochina.



Figure 1. Geographic Location of the Community of Chistochina Courtesy of Google Earth 2017.

Collaboration

The Chistochina Community Wildfire Protection Plan (Chistochina CWPP) is a collaborative effort between Cheesh'Na Tribal Council, Ahtna, AITRC, the State of Alaska DNR Forestry, BLM and the National Park Service. Receiving input from all entities will ensure a smooth transition and continuation of this CWPP. The CWPP will only succeed if a collaborative effort is implemented. There are many entities that have a vested interest in the success of this plan:

Chistochina Village – The involvement of the Chistochina community and their willingness to invite other parties to work together to identify the risks, issues and challenges of adopting this plan is crucial. Prioritizing and identifying tasks and items required to mitigate each risk will require community involvement and teamwork with other stakeholders.

Ahtna – As the land owner and the regional corporation for the village Ahtna shares a large burden of responsibility for the village. Ahtna will be very key to the future implementation of the plan and long-term monitoring of the work completed.

Ahtna Intertribal Resource Commission (AITRC) – As a lead advocate for the Ahtna Region villages AITRC has a front seat in the CWPP. They applied and received funding to complete this CWPP process and plan. They also have applied for implementation WUI grants for the action items of the plan. AITRC will also be involved in finding solutions such as funds to complete biomass projects and the monitoring of the work completed.

State of Alaska Division of Forestry (DOF) – DOF acts as the lead agency for fire suppression in the Copper River Basin. DOF has a mission to prevent and suppress wildfires in compliance with the Alaska

Fire Plan. DOF has the equipment and trained personnel to contribute to the future success of this CWPP.

Local VFD – Gakona VFD responds to fires in Chistochina, and is an important role in wildfire mitigation efforts. Chistochina has a VFD in the neophyte stage of development. It registered on paper and is establishing a firehall and equipment to hopefully be fully functional by 2020.

BLM – The BLM is responsible for fire suppression administration (not directly for suppression) of the native lands in the region, including changes to the fire plan and funding fire suppression efforts on native lands. The BLM FMO and supporting staff have expertise and resources to lend to the CWPP effort.

National Park Service NPS (Wrangell Saint Elias) - With the worlds largest national park system on the doorstep of the village the NPS has an important role to play in the surrounding communities. They have a fire staff of FMO and AFMO with extensive experience to lend to the plan.

Chistochina CWPP Planning Area

The Chistochina CWPP Planning Area is located in the Copper Basin of Alaska and represents a land area of approximately 3686 acres. The project area sits on the north side of the great Copper River alluvial flood plain with the village 1000 feet distant. The Chistochina flows from the north into the Copper River just east of the village and forms the eastern border with its nearly half mile alluvial flood plain. The north side is vegetated by a predominant aspen stand with a mix of white spruce trees rises three to four hundred feet above the nearly flat landscape of the project area. The western side is bordered by wetlands and boggy areas with an active beaver population.

Community Profile

Community of Chistochina

Chistochina is located between mile 31 and 37 on the Tok Cutoff Highway, Chistochina is a midway point between the Canada–US border and Anchorage, or midway between Tok and Glennallen. Figure 1 shows the geographical location of Chistochina.

Today, Chistochina is located on a bluff near the Copper River near an old fish camp approximately 42 miles northeast of Glennallen at Mile 32.7 of the Tok Cutoff of the Glenn Highway. It was moved to this site in the 1960s when highways were constructed in the area. Chistochina is surrounded by several waterways; the Copper and Chistochina Rivers and Sinona and Boulder Creeks. In 2010, Chistochina was home to 93 people (U.S. Census) and services include a school, trading post, health clinic, bed and breakfast, community hall, and the Mount Sanford Tribal Consortium (a consortium of Mentasta Lake

and Chistochina Tribes). The Cheesh’Na Tribe, one of the eight federally-recognized Tribes within the Ahtna Region, is in this community.

WUI Boundary

The wildland-urban interface is frequently defined as “the line, area, or zone where structures and other human development meet or intermingle with undeveloped wildland or vegetative fuel.” The WUI boundary was determined by the 100 meter buffer on the major highways and a 400 meter buffer of private parcels that contained a structure and were near the highway corridor. Single structures that occurred long distances from existing infrastructure were not included in the WUI delineation.

The proposed Chistochina Wildland-Urban Interface Boundary buffers the Glenn-Tok Alaska Highway 1 and expands outward to include the community of Chistochina. This boundary is very close to the Critical fire protection area of Chistochina but does not include the area east of the Chistochina River. Refer to Figure 7 for WUI within the Chistochina planning area.

Population

Table 2 represents the estimated population of the planning area according to data acquired by the U.S. Census Bureau in 2010 (U.S. Census Bureau, 2010). While the census area boundaries did not precisely represent the planning area boundaries, the data presented are believed to generally reflect the population estimates. Additional information is provided on housing units and types of occupancy to illustrate the level of seasonal, recreational, or occasional use within the planning area.

The Chistochina Planning area encompasses 483,068 acres. Figure 4 represents the primary ownership distribution within the planning area. Federal ownership comprises 28.4% of the land area, state of Alaska ownership comprises 25.5%, Ahtna, Inc. comprises 37.9%, Ahtna, Inc. selected lands comprises 7.6%, and other private ownership comprises 0.1%.

Table 2: Estimated Population of Chistochina.

Chistochina	
Population	
Year-round occupants	93
Total Housing Units	
Occupied year-round	36
Seasonal, recreational or occasional use	22
Vacant	10
Total	68

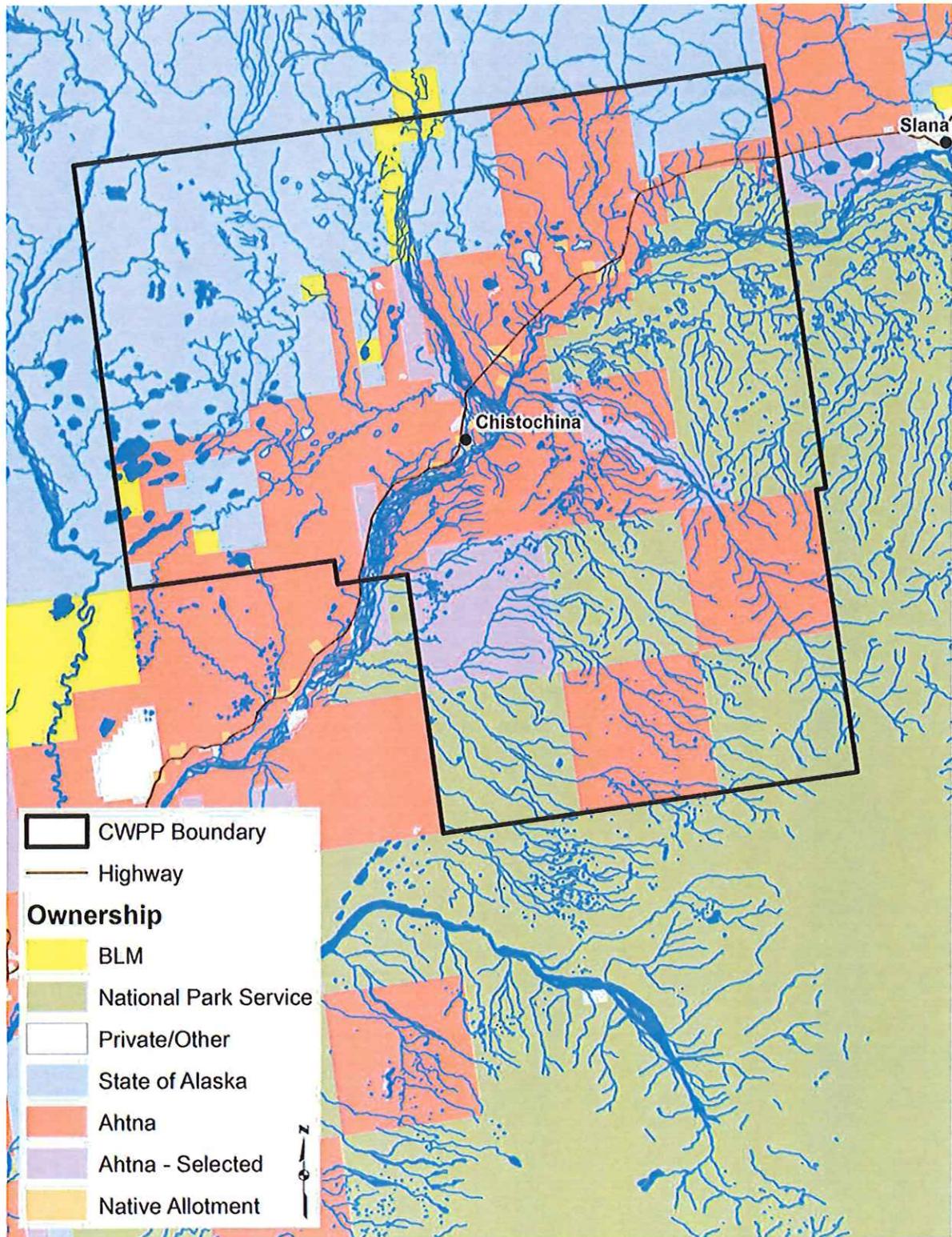


Figure 2. Chistochina CWPP Planning Area and Land Ownership.

Critical Facilities

Critical facilities are defined as facilities critical to government response and recovery before, during or after a wildfire. Critical facilities for the Chistochina area include public works facilities, medical centers, and shelters. Critical facilities also include those that are essential to the continued delivery of community services such as medical facilities, potable water and community service centers.

Community Risk Assessment

The following is a detailed list of highest to lowest risks contributing to wildfire threat level for the Village of Chistochina.

Chistochina Summarized Risk Assessment

The following is the list of highest to lowest risk for the Village of Chistochina.

- 1. Lack of defensible space for several private homes, structures and public structures.** This is twofold; first is the hazardous forest fuels in close proximity to the home which threatens the survival of the home, second is the large amount of abandon or dead vehicles, snow machines, construction materials and other type debris surrounding many homes. This is a large threat to the survival of the home when on fire and is also toxic and hazardous to the responding firefighters and residents. It also immensely hinders firefighting efforts and can make the job of defending the home almost impossible due to severe danger in an emergency situation. A specific defensible space recommendation given the fuels and situation is discussed in this plan.
- 2. Insufficient clearing for egress and ingress on most roads including the Glenn Highway.** These access points may not be open for travel including evacuation during a wildfire and could block response efforts by wildfire response by engines, tenders and personnel.
- 3. No community safety zone with shelter.** The community center is located within hazardous forest fuels adjacent to the structure and should not be considered to be a safety zone or a safe evacuation location during significant wildfire event in Chistochina.
- 4. Communication tower not safe from wildfire.** Hazardous forest fuels surround the communication tower and guy lines. The communication tower would likely not survive a wildfire, resulting in a loss of communication imperative to residents and emergency responders.
- 5. Loss of electricity lines and infrastructure post-significant wildfire event.** This is due to the volume and proximity of hazardous forest fuels. Alaska Power and Telephone (APT) cuts power as soon as lines are threatened to provide safety for the system and emergency responders. The

result is no power to home and a loss of any ability to use well water from loss of power to the water pumps. Few homeowners have any backup power generators, and, near total loss of electrical lines and poles which could result in loss of power for weeks.

6. **Minimal firefighting equipment and personnel in the village for initial response to a wildfire.** The Gakona VFD responds as Initial Attack (IA) to Chistochina within 25 minutes. The response time for engines and personnel from Copper Center is 45 minutes depending on availability. If emergency response is not timely and effective the fire could quickly grow with little hope of containment before significant destruction.
7. **No evacuation and emergency response plan for a large fire in or adjacent to the village.** Currently Chistochina has no evacuation or emergency response plan in place for wildfire events.
8. **The volume and congestion of hazardous forest fuels throughout and immediately surrounding the village.** The congestion of continuous heavy to extreme fuel loading could result in extreme fire behavior and the loss of the majority of homes and structures and values in the village.
9. **Little to no outreach and fire education programs in place.**
10. **Maintaining a sustainable approach to fuel reduction and community independence.** Fuels around the area may be used after fuel reduction products as a sustainable option to oil-based heat and power in the community.

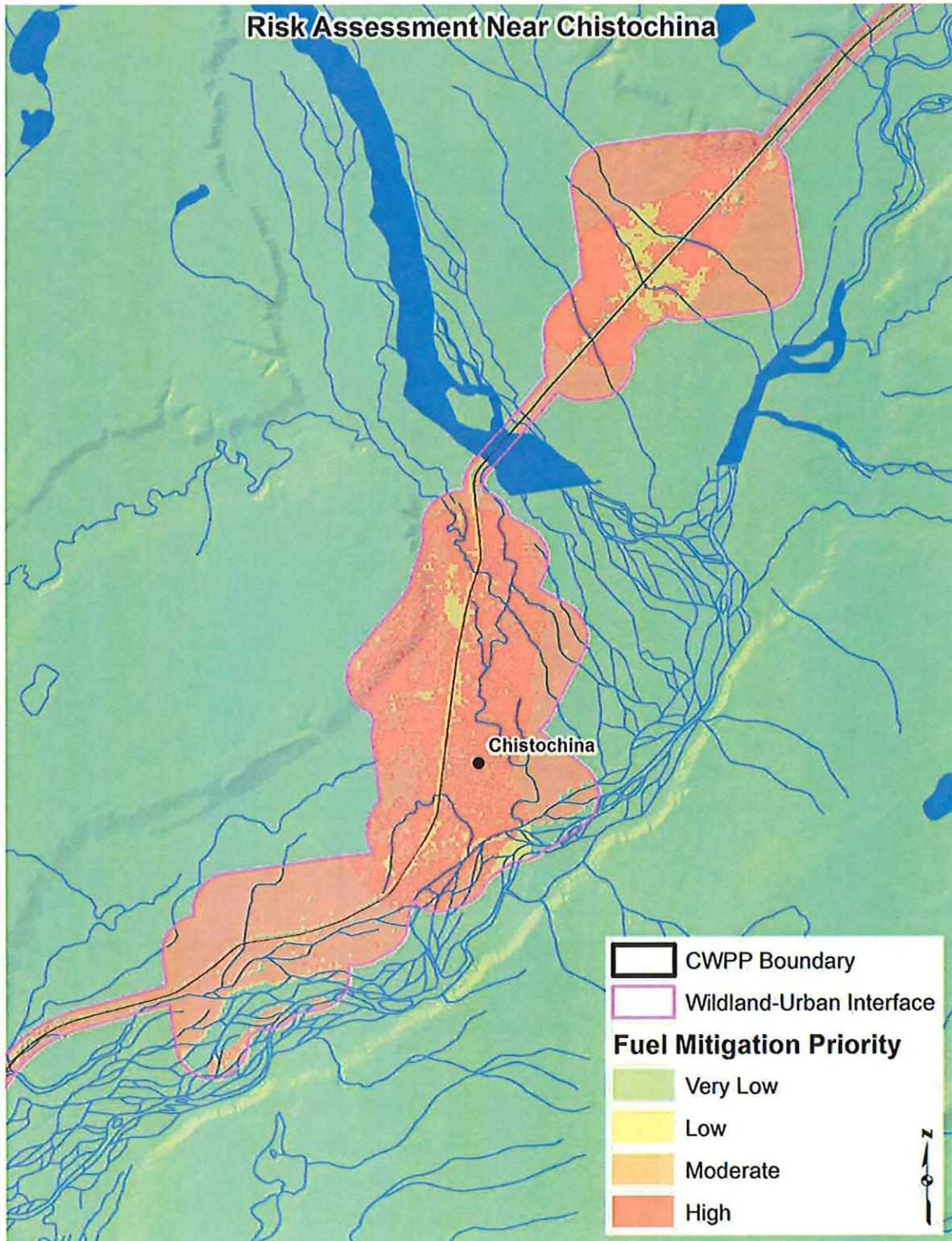


Figure 7. Fuels Risk Assessment, WUI Boundary, and CWPP Planning Area Boundary for Chistochina.

Chistochina Action Plan

Prioritized Tasks and Matrix of Mitigation Measures

Identified prioritized tasks to complete of risk mitigation measures in response to the Chistochina risk assessment to complete are as follows :

Table 3. Chistochina CWPP Task Matrix.

Chistochina CWPP Task Matrix		
Risk	Associated Tasks	Contacts/Responsible Entities
<p>1. Lack of defensible space (including organic fuels, materials, household debris) for several private homes, structures and public structures.</p>	<p>1. Conduct home and structure assessments on every home and structure willing to participate. 2. Conduct training with key village residents how to do home and structure assessment for defensible space, and work with the residents to understand how to improve the survivability of their homes. 3. Develop a community fuel depot where hazardous fuels removed by home owners and or community fuel reduction and removal programs can be placed and burned by DOF or VFD during safe burning periods. This has proven to be very helpful and successful in other communities. 4. Complete a hazardous material cleanup project on homes/structures within the planning area. 5. Apply for grant program and funding for a village cleanup project for removal of hazards materials such as abandon vehicles, snow machines, household debris, and other than hazardous forest fuels that will threaten both village residents and responding firefighters.</p>	<p>Village administrator, AITRC's contract forester, grant applied for funding if successful would be available June 2018. Ahtna Land manager for approval of land use activities.</p>
<p>2. Insufficient clearing for egress and ingress on most roads including the Glenn Highway.</p>	<p>1. Apply for WUI grant for Defensible Space work to be completed. 2. Apply for BIA funds to complete fuels reduction/defensible space work. 3. Initiate contact with AK DOT for highway clearing along DOT maintained roadways. 4. Complete the Safe Passage Egress and Ingress project by removing hazardous forest fuels from identified roads imperative for safe travel during an emergency.</p>	<p>Village administrator, AITRC, AITRC contract forester, Ahtna Land Manager, AKDOT</p>

3. No community safety zone with shelter.	1. Complete the Community Safety Zone and Evacuation Center Project by removing hazardous forest fuels from identified units around the community center.	Village administrator, AITRC, AITRC contract forester, Ahtna Land Manager, AKDOT,
4. Communication tower not safe from wildfire.	1. Contact AK State Communication for clearing the Communication Tower of hazardous fuels and debris. 2. Complete the Communication Tower Safety Zone Project by removal of hazardous forest fuels within 300 feet of the tower and guy lines.	Village administrator, AITRC, AITRC contract forester, Ahtna Land Manager, AK ETS, AK DOF, Cell Phone Company
5. Loss of electricity lines and infrastructure post-significant wildfire event.	1. Complete the Chistochina Safe Power Project by removal of hazardous forest fuels from within 100 feet of the poles and line and all other power infrastructure.	Village Administrator, AITRC, AITRC contract forester, Ahtna Land Manager, Alaska Power & Telephone
6. Minimal firefighting equipment and personnel in the village for initial response to a wildfire.	1. Develop a Chistochina wildfire response program with local commitment, training, equipment and coordination with State of Alaska Copper River DOF office; included but not limited to: fire extinguisher, fedcos, hand tools, fire engine, pumps and hose. 2. Create a community watch program for fire and burning activities. 3. Strengthen local prevention programs in coordination with Copper River DOF.	Village Administrator, AITRC, AITRC contract forester, DOF, State Fire Marshal's Office
7. No evacuation and emergency response plan for a large fire in or adjacent to the village.	1. Develop and implement a Chistochina emergency response plan using community, DOF collaborative group input. 2. Ensure the emergency response plan is easily accessible by community members and emergency personnel.	Village Administrator, AITRC, AITRC Contract Forester, DOF, VFD, Cooperators, AP&T, State DHS
8. The volume and congestion of hazardous forest fuels throughout and immediately surrounding the village.	1. Complete the Chistochina Safe Village Phase #1 hazardous forest fuels from with 150 feet of values of risk in identified Hazardous Fuels Units. 2. Complete the Chistochina Safe Village Phase #2 hazardous forest fuels the next 150 feet out from Phase #1 project in identified Hazardous Fuels Units. 3. Complete the Chistochina Safe Village Phase #3 hazardous forest fuels the next 300 feet out from Phase #2 project in identified Hazardous Fuels Units.	Village Administrator, AITRC, AITRC Contract Forester, NRCS, Ahtna Land Manager
9. Little to no outreach and fire education programs in place.	1. Conduct educational meetings for the community on the CWPP, emphasizing the importance of completing defensible space, emergency and evacuation plans, fire suppression responses and fire prevention with support and cooperation with Copper River DOF. 2. Develop safe burning practices and burn-barrel exchanges	Village Administrator, AITRC, AITRC Contract Forester, DOF, VFD, Cooperators, AP&T, State DHS

	<p>3. Conduct yearly fire-prevention educational sessions in local schools.</p>	
<p>10. Maintaining a sustainable approach to fuel reduction and community independence.</p>	<p>1. Develop local business Hazardous Fuels Reduction removal capacity. 2. Complete the community center wood boiler project to begin heating the community with wood chips. 3. Develop an initiative to burn cordwood with new stoves and boilers instead of fuel oil. 4. Develop capacity and business to provide sustainable local wood products; including seasoned wood from completed fuel reduction projects to Copper River Basin and Valdez markets. 5. Complete the Chistochina Safe Village and Moose Habitat Enhancement PLOD project #1, 2, and 3 as identified in the plan.</p>	<p>Village Administrator, AITRC, AITRC Contract Forester, NRCS, Ahtna Land Manager, SBA, AK Economic Development, REAP, US Department of Energy, Alaska Energy Authority</p>

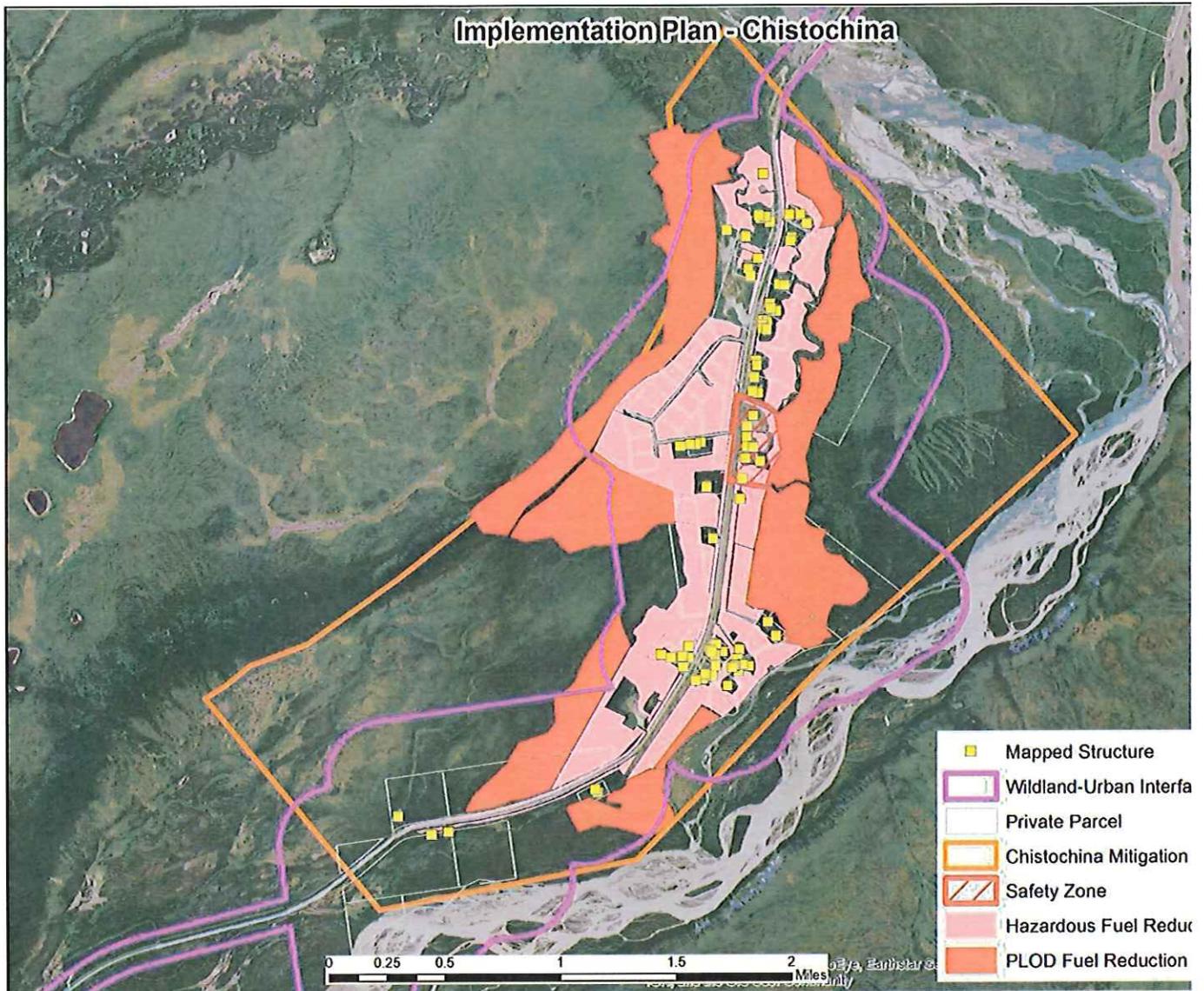
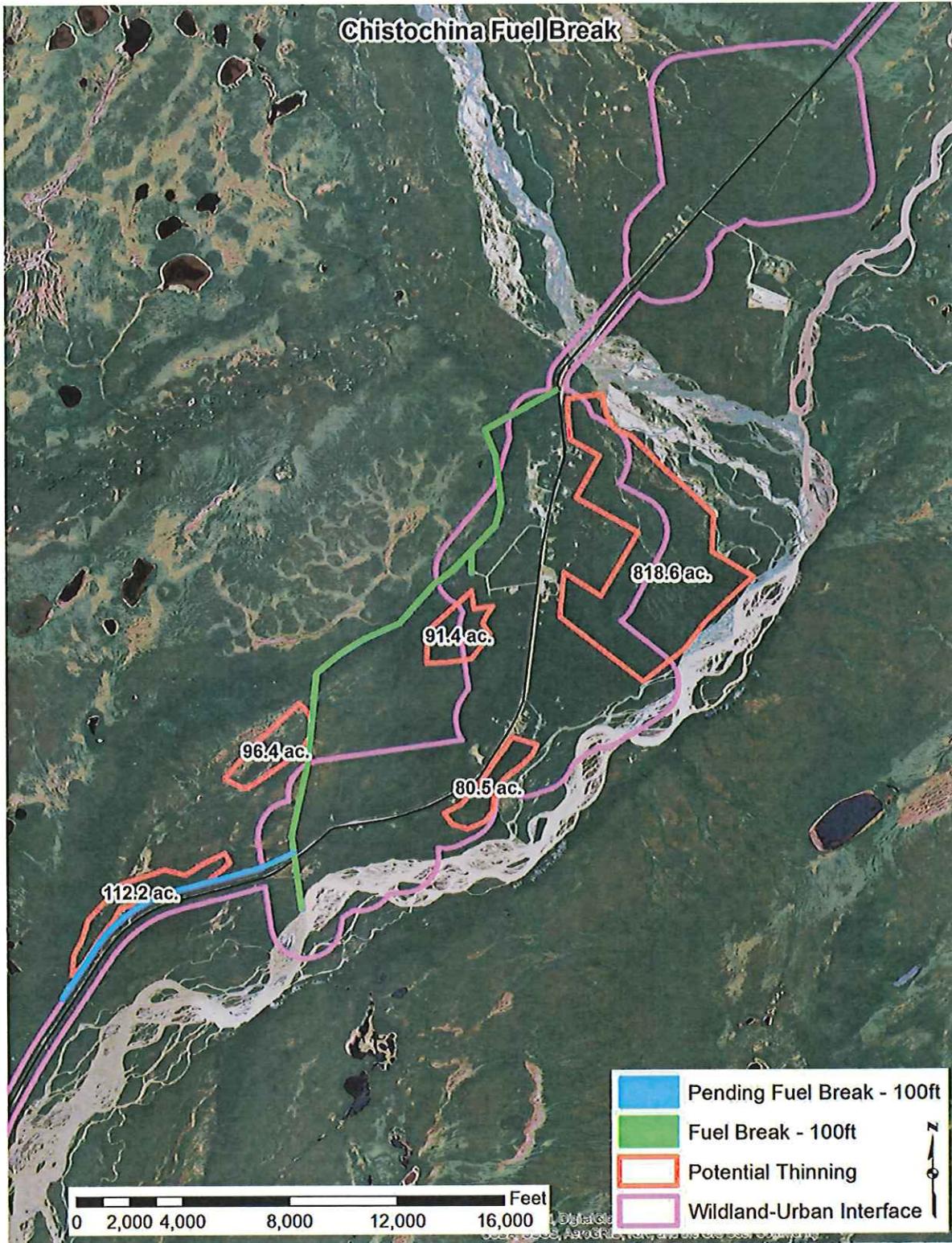
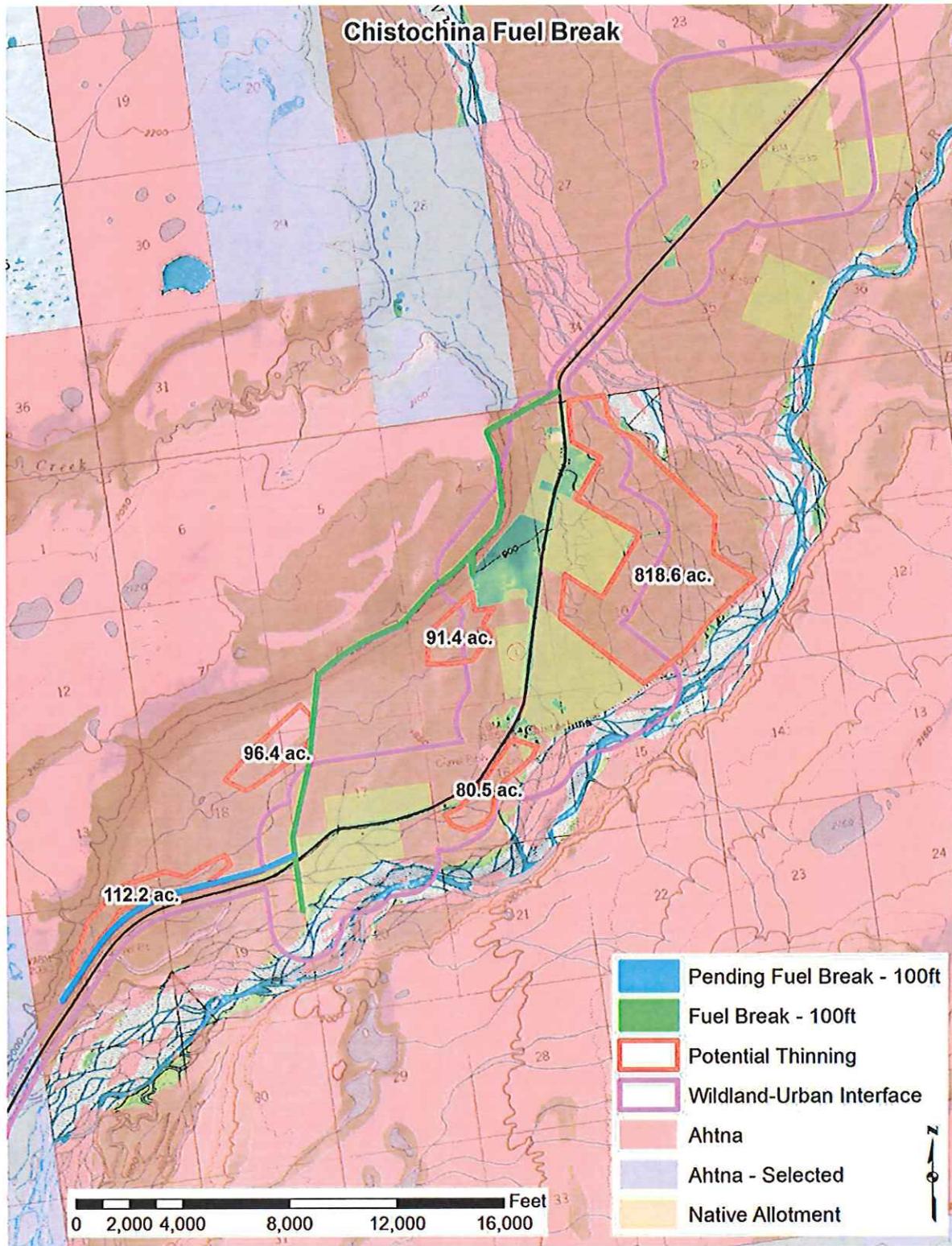


Figure 8. Proposed Mitigation Plan for Wildland Fire Reduction in CWPP Area.





Appendix A – Detailed Treatment Maps

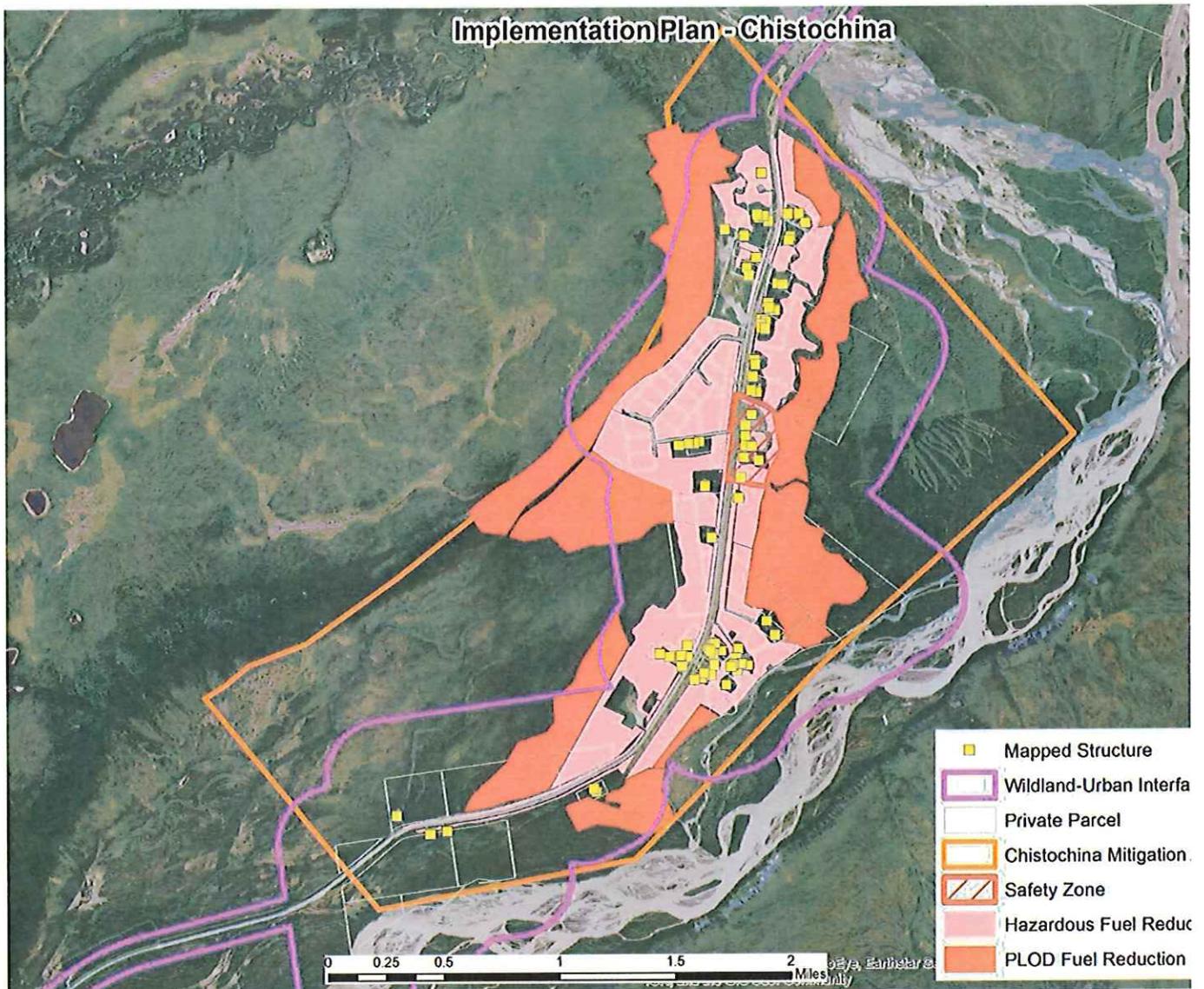


Figure B-1. Overview of Chistochina Village, structures, completed treatments, and proposed treatment areas.

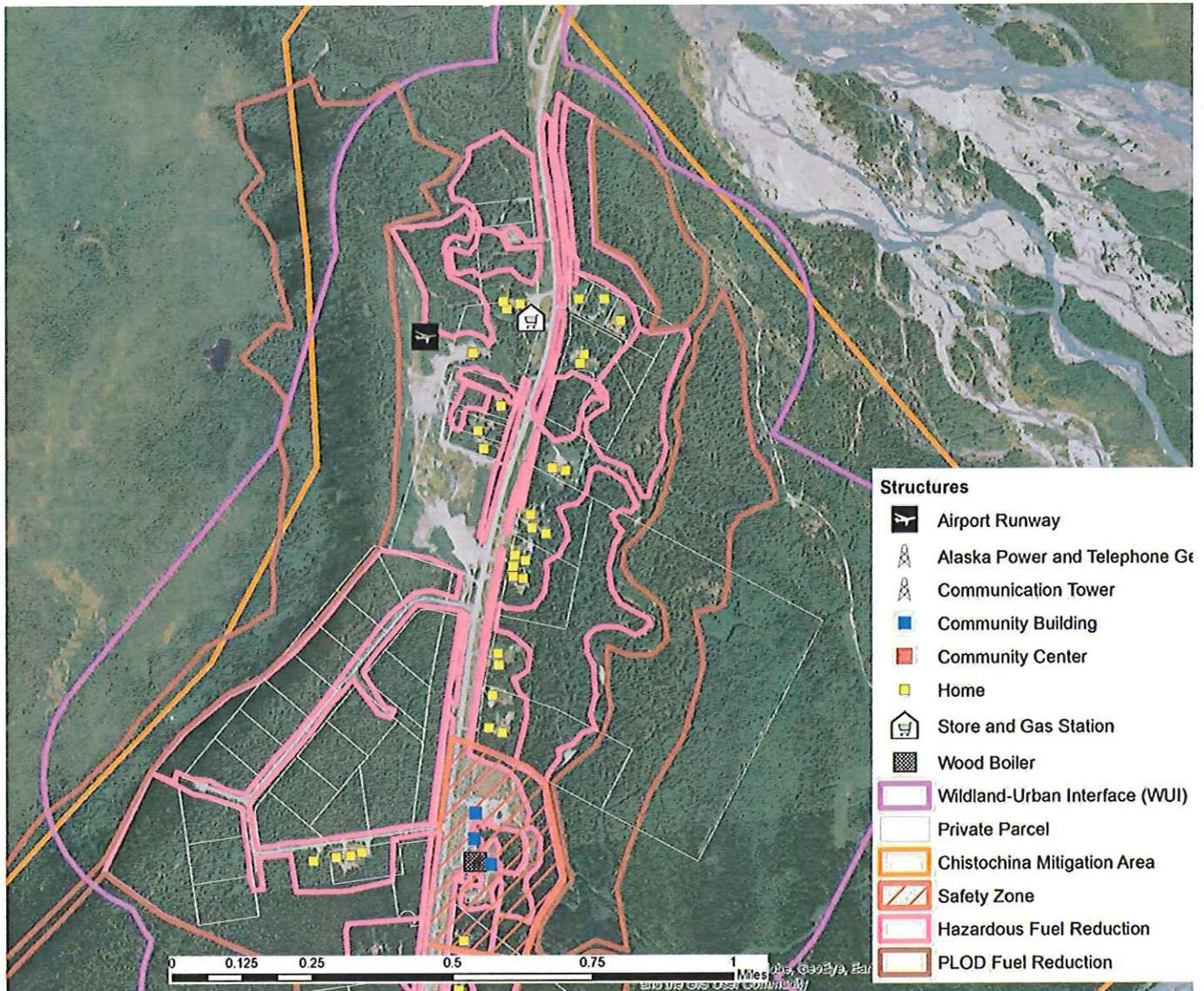


Figure B-2. Northern portion of Chistochina Village showing detailed implementation plan.



Figure B-3. Central portion of Chistochina Village showing detailed implementation plan.

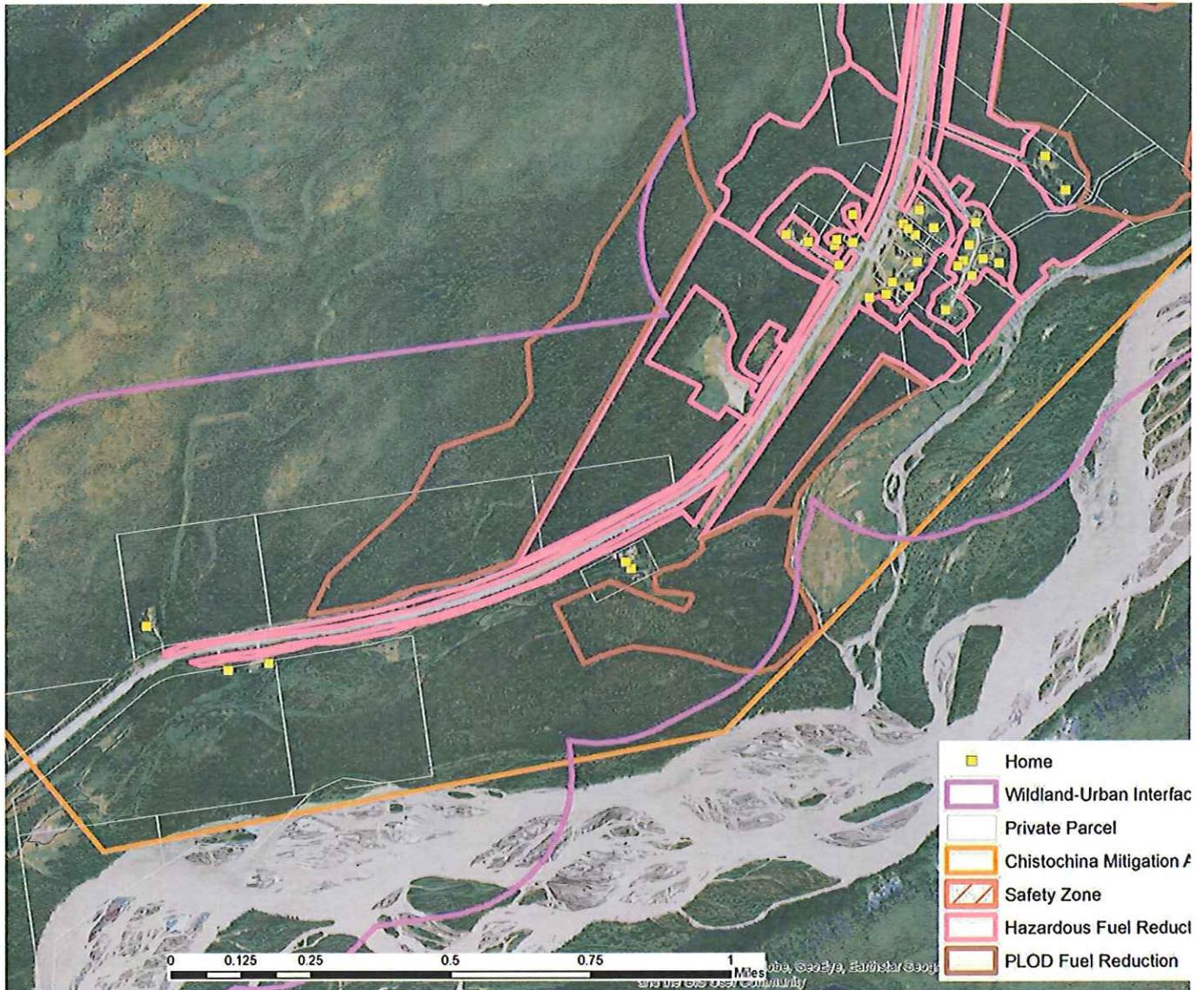


Figure B-4. Southern portion of Chistochina Village showing detailed implementation plan.

High and Moderate Risk Fuels

The results of the risk assessment identified a total of 6,822 acres in the category of high or moderate risk fuels within the WUI for the Chistochina planning area. In addition, the PLOD occupies approximately 729 acres. Including the PLOD there are 7,002 acres that should be considered as high priority for fuels mitigation treatment (a portion of the PLOD overlaps with areas that already have a high or moderate risk rating). Table B-1 displays the acres in each risk category by landowner.

Table B-1. Risk rating and PLOD acres by landowner within the Chistochina planning area.

Land Management	PLOD	High	Moderate	Low	Very Low
Ahtna	547.56	1,242.09	3,490.83	132.03	488.89
Ahtna - Selected	8.94	62.03	121.66	9.32	12.72
Native Allotment	168.09	530.68	1,050.18	87.24	40.98
NPS		1.15	2.33		
Private	2.48	159.94	221.23	54.03	15.68

Appendix B – Copper River Valley Historical Fire Information: 2012-2017

Table C-1. Reported wildland fires within the Chistochina Fire Plan Area since 1940.

DATE	NAME	YEAR	MANAGEMENT	LATITUDE	LONGITUDE	ACRES	GENERAL CAUSE
6/24/1940	Nebesna Road Mile 35.5	1940		62.599998	-144.633331	2	Human
5/6/1941	Nebesna A	1941		62.549999	-144.733337	29	Human
5/26/1942	31 Mile	1942		62.583332	-144.649993	0.1	Human
5/14/1943	Nickoli	1943		62.5	-144.816665	0.1	Human
5/5/1943	Fred Nealy	1943		62.549999	-144.683334	0.1	Human
5/25/1943	Frank Charley	1943		62.583332	-144.583328	0.3	Human
6/12/1944	31 mile	1944		62.549999	-144.716659	0.1	Human
7/15/1946	Mile 36 Fire	1946		62.633335	-144.600006	0.1	Human
5/25/1947	Mile 25 Slana Road	1947		62.5	-144.833328	2	Human
5/8/1950	Pocket Lakes	1950		62.516666	-145	25	Human
7/12/1951	Chistochina	1951		62.566665	-144.666671	75	Lightning
11/4/1953	November 4 Fire	1953		62.616664	-144.633331	0.1	Human
7/30/1953	Mile 36 1/2 Chistochina	1953		62.566665	-144.666671	0.3	Human
8/3/1953	Chistichina	1953		62.599998	-144.550003	15	Lightning
5/31/1954	CHRISTOCHINA MILE 37	1954		62.616664	-144.583328	25	Human
5/25/1954	SINONA CREEK	1954		62.650001	-144.733337	30	Human
5/16/1956	CHISTOCHINA	1956		62.583332	-144.649993	3	Human
6/1/1956	FISH CREEK	1956		62.5	-144.216659	0.1	Human
7/11/1957	CHISTOCHINA	1957		62.599998	-144.633331	0.1	Human
6/9/1958	CHISTOCHINA	1958		62.5	-144.75	0.3	Human
9/16/1958	SINONA CREEK	1958		62.716667	-144.816665	1.2	Human
4/21/1959	CHISTOCHINA #2	1959		62.616664	-144.716659	0.5	Human
4/21/1959	CHISTOCHINA NORTH 5	1959		62.616664	-144.716659	5	Human
8/14/1990	INDIAN	1990	LIMITED	62.666667	-144.300003	436	Lightning
7/4/1990	TULSONA	1990	LIMITED	62.633335	-144.850006	3	Lightning
7/10/1994	EUBANKS	1994	CRITICAL	62.549999	-144.616668	0.1	Human
7/9/1995	Knight Fire	1995	CRITICAL	62.716667	-144.25	0.1	Human
6/13/1995	Gakona River	1995	LIMITED	62.766666	-145.050003	15	Lightning
6/12/1995	BILLY LAKE	1995	LIMITED	62.5	-144.716659	1060	Lightning
6/20/1996	CHISTO RIV. #2	1996	LIMITED	62.75	-145.03334	35	Lightning
7/5/1997	49.5 TOK HWY	1997	FULL	62.716667	-144.300003	0.1	Lightning
9/5/1997	chisto Trail	1997	LIMITED	62.666667	-144.699996	0.1	Human
7/4/2000	HALEY CREEK	2000	FULL	62.41667	-144.4667	0.3	Human
5/28/2002	MP 55 TOK RD.	2002	MODIFIED	62.71667	-144.2	0.1	Human
6/9/2003	Chistochina	2003	CRITICAL	62.56667	-144.65	0.1	Human
6/28/2004	Indian Creek	2004	LIMITED	62.76667	-144.45	82.9	Lightning
5/16/2009	Mile 36.5 Tok cutoff	2009	CRITICAL	62.613334	-144.61528	0.2	Human
6/26/2013	Sinona Creek	2013	LIMITED	62.709944	-144.874138	0.2	Lightning

6/26/2013	Chistochina Trail	2013	Full	62.658083	-144.793766	31.9	Lightning
9/10/2013	Billy Lake	2013	LIMITED	62.395083	-144.73775	1	Lightning
6/24/2015	Chistochina	2015	Modified	62.64395	-144.57235	1	Lightning
7/14/2016	Yokneda Lake	2016	Limited	62.5315	-144.72717	3264.8	Lightning
7/13/2016	Cutoff	2016	FULL	62.700083	-144.325277	49.1	Lightning
7/19/2016	Chistochina Airstrip	2016	CRITICAL	62.562638	-144.668777	0.1	Human
8/4/2017	Chistochina River	2017	Critical	62.61745	-144.619267	98	Human

Table C-2. Wildfire Occurrence by Day of the Week for the Copper Basin.

	2012	2013	2014	2015	2016	2017	Average
February	0	1	0	0	0	0	0.17
March	0	0	0	0	0	1	0.17
April	3	2	0	1	2	2	1.67
May	6	6	4	8	4	6	5.67
June	7	20	5	25	5	4	11.00
July	2	12	2	9	15	2	7.00
August	5	11	1	5	8	3	5.50
September	3	3	0	1	2	2	1.83
October	1	0	0	0	1	0	0.33

Table C-3. Wildfire Occurrence by Month for the Copper Basin.

	2012	2013	2014	2015	2016	2017	Average
Sunday	4	8	1	4	7	3	4.50
Monday	6	7	1	4	5	2	4.17
Tuesday	4	10	6	7	5	3	5.83
Wednesday	3	10	3	11	5	4	6.00
Thursday	4	8	0	5	5	2	4.00
Friday	4	7	0	7	5	3	4.33
Saturday	2	5	1	11	5	3	4.50

Structure Densities and Evacuation Routes

Information on structure densities per square mile for the planning area was combined with information on primary evacuation routes to produce a weighting prioritizing the vulnerability of the communities to wildfire risk. Evacuation routes were based on a 100 meter buffer delineated on either side of Highway 1. The structure densities per square mile were given weightings based on the following classes: 0=0, >0-1=1, >1-2=2, >2-5=3, >5-10=4, >10-25=5, >25-50=6, >50-100=7, >100-150=8, >150-200=9, >200=10. Structure density in the Chistochina area did not exceed 150 structures per square mile, so no areas were assigned a value greater than eight.

Wildland-Urban Interface

The wildland-urban interface is frequently defined as “the line, area, or zone where structures and other human development meet or intermingle with undeveloped wildland or vegetative fuel.” The WUI boundary was determined by the 100 meter buffer on the major highways and a 400 meter buffer of private parcels that contained a structure and were near the highway corridor. Single structures that occurred long distances from existing infrastructure were not included in the WUI delineation.

Structure Density

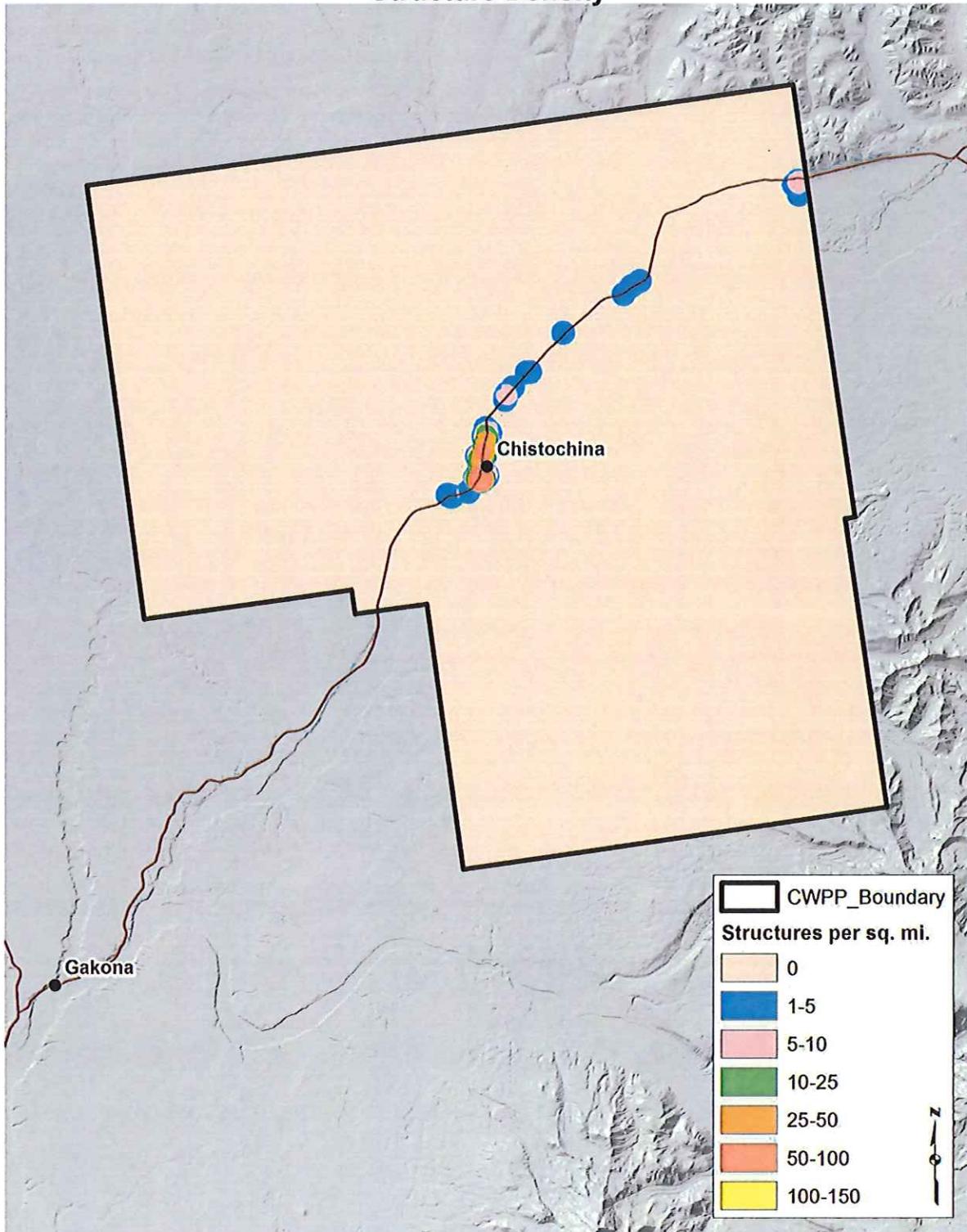


Figure D-3. Structure density in Chistochina Fire Plan Area.

Cumulative Effects – Final Risk Assessment

The fuel hazards/slope information was combined with the structure densities/evacuation route information to produce a map of each stand's cumulative risk to human life or property. This map used the overall fuel hazard rating for each location that ranged from 1-15 based on the amount and type of fuels present as well as the slope. It then combined the fuel hazard with a structure density/evacuation route rating that ranged from 1-15, with 15 being the highest priority areas for human safety and evacuation areas and 1 being wildlands not in proximity to populated locations or evacuation routes. The fuel hazard rating and population/evacuation rating were combined using an 80%/20% split. This means 80% of the final score came from the fuels hazard/slope information and 20% of the final score came from the structure densities/evacuation route information. The resulting maps identify the combined ratings and identifies forest stands that present the greatest risk to human life or property under their existing conditions. The stands with high ratings can be listed by ownership and prioritized for preventive actions, either by agency management or for possible funding support for fuel thinning on private lands.

Water Quality and Watersheds

The planning area represents portions of two primary watersheds: the Chistochina River Basin and the upper Copper River Basin. The Copper River is a critical part of the local environment and any impacts in these watersheds would have profound impacts on local communities as well as communities further downstream.

The effects of wildfire on water quality and the watershed within the plan area will depend on several factors including the severity/intensity of the fire, post-fire precipitation, actions taken to control or suppress the fire, and the condition of the watershed pre-fire. Wildfire usually results in the loss of vegetation as well as the reduced capacity for soils to soak up rainwater and snow melt. The result is increased runoff and a greater volume of water reaching streams and lakes in a shorter period of time. Flash flooding is often a major concern following a significant wildfire event within a watershed. In addition, the loss of vegetation can result in increased sediment transport to streams and lakes due to soil erosion, reduced soil infiltration, and increased water volumes and overland flow rates. Water quality impacts frequently observed post-wildfire include increased transport of organic materials, nutrients and chemicals (i.e., fertilizers, herbicides) to surface waters, as well as increased turbidity (i.e., suspended particles) and water temperatures.

Air Quality

Wildfires are considered a natural source of air pollution and can sometimes cause severe short-term smoke impacts. These smoke impacts can pose a major health risk for some individuals. Symptoms

from short-term smoke exposure range from stinging eyes, scratchy throat, cough, irritated sinuses, headaches, and runny nose. Individuals with pre-existing health conditions such as asthma, emphysema, congestive heart disease and other conditions can have serious reactions. The elderly and young children are considered high-risk groups for health complications due to smoke.