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Photo Credit: Jennifer Myslivy, National Park Service

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

Executive Summary

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

This CWPP will:

- Assess the risk posed by wildfire to the community of Gakona;
- 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.

Gakona 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.

Gakona Risk Assessment

The following is the list of highest to lowest risk for the Village of Gakona. In addition Figure ES-2 provides a generalized map of wildfire risk within the planning area.

- 1. Lack of Defensible Space for some private homes and structures.** Also review of each home and structure construction and physical properties needs to take place. Additionally, other items stored around the homes such snow machines and vehicles that do not run are very problematic for fires in the urban interface. They immensely hinder firefighting efforts and are a significant health risk and danger to the firefighter and residents making suppression efforts just not possible do to risk at times.
- 2. Insufficient clearing of hazardous forest fuels for egress and ingress on the only main road leading in from the Glenn Highway.** This road 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 islands and stands of hazardous forest fuels in the close proximity to the structure and should not be considered to be a safety zone or a safe evacuation location during a significant wildfire event in Gakona.
- 4. 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.** (Copper River Electric) 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.
- 5. Little to no firefighting equipment and personnel in the village for initial response to a wildfire.** State of Alaska DOF response time for engines and personnel from Tazlina is 25 minutes if they are available and not on another fire response. Without proper response during conditions of high fire danger, the fire could quickly grow with little hope of containment before significant destruction would occur.
- 6. No evacuation and emergency response plan for a large fire in or adjacent to the village.**
- 7. There are stands of spruce in and around the parameter of the village that have been cleared of ground fuel and ladder fuels but were not thinned and are susceptible to a wind driven crown fire.**

8. **The volume and congestion of hazardous forest fuels immediately surrounding the village within 300 ft.** The congestion of continuous heavy to extreme fuel loading could result in extreme fire behavior and the loss of some homes and structures and values in the village.
9. **The volume and congestion of hazardous forest fuels within ½ mile of the village.**

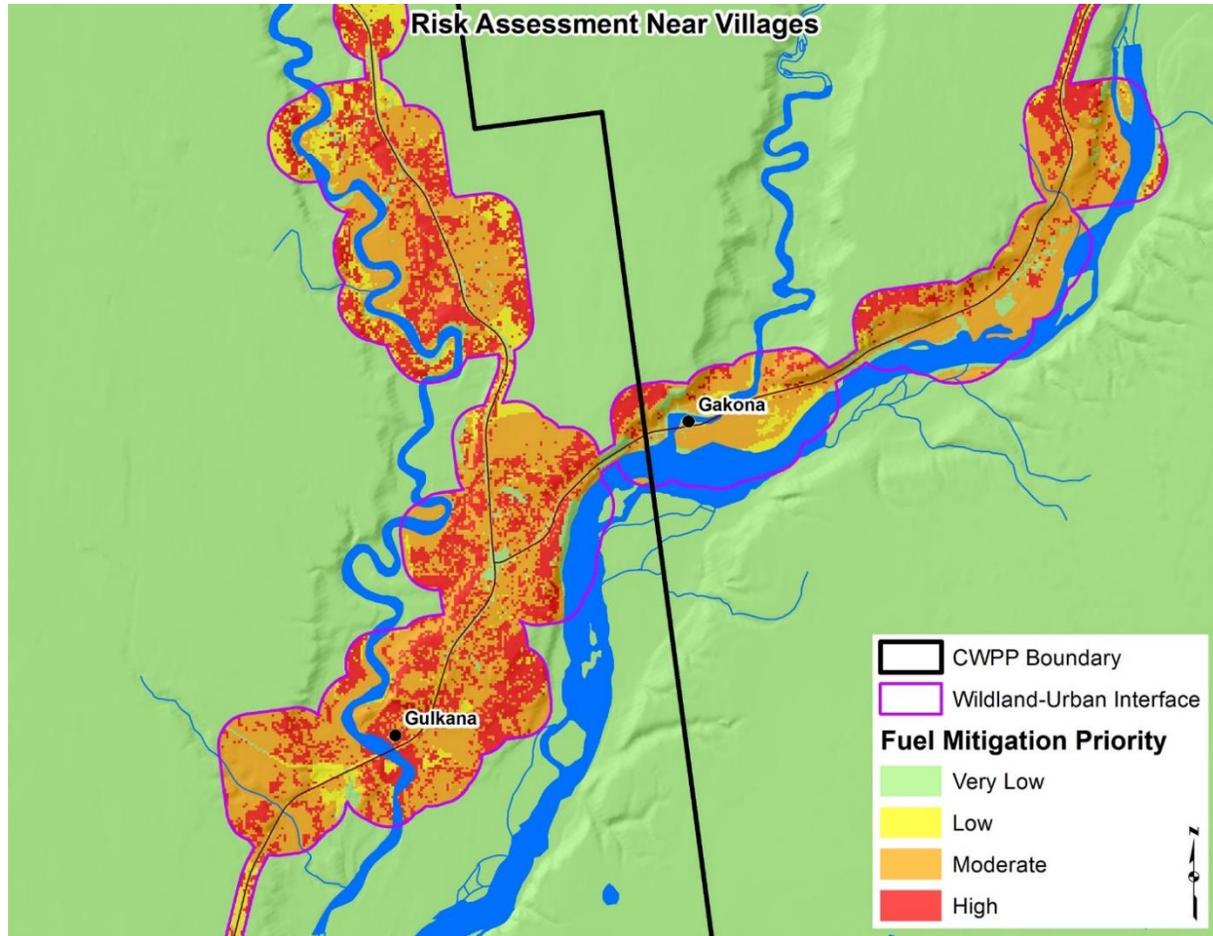


Figure ES-2. Close up of Risk Assessment and WUI Boundary Surrounding the Community of Gakona.

Prioritized Task and Matrix of Mitigation Measures

1. Conduct training with a few key village residents how to do home and structure assessment for defensible space. Inclusive in training will be mitigation for fuels near homes and structures during a potential fires (oil, propane tanks).
2. Conduct home and structure assessments on every home and structure willing to participate and work with the residents to understand how to improve the survivability of their homes. A specific defensible space recommendation for Gakona given the fuels and situation is shown in this plan.
3. Conduct education meetings for the community on the CWPP, importance of completing defensible space, emergency and evacuation plans, fire suppression responses and fire

prevention. This would include State of Alaska DOF and Gakona and Glenn-Rich VFDs in lead with these efforts.

4. Develop a Gakona wildfire response program with local commitment, training, equipment and coordination with State of Alaska Copper River DOF office, Gakona VFD, and Glenn-Rich VFD. This may be fire extinguisher, fedcos, hand tools, fire engine, pumps and hose.
5. Strengthen local prevention programs work with Gakona VFD, Glenn-Rich VFD and State of Alaska DOF.
6. Burn barrel exchange
7. Safe burning practices.
8. Community watch program for fire and burning.
9. Multiple yearly fire prevention educational sessions in the schools.
10. Apply for WUI grant for Defensible Space and safety zone around the community center for an evacuation and emergency location.
11. 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.
12. Complete Gakona Defensible Space Project on all homes and structures willing to participate.
13. Complete the Gakona Safety Zone removing hazardous forest fuels from near the Community Center to effectively act as an Evacuation & Emergency Disaster Center.
14. Complete the Gakona Safe Passage project removing hazardous forest fuels within 300 feet of the road leading into the village.
15. Apply for any funding program to complete hazardous fuels removal projects.
16. BIA funds for hazardous fuel reduction work.
17. Develop local business Hazardous Fuel Reduction removal capacity.
18. Apply for funding to heat the community center with a wood chip boiler/ solar panels.
19. Develop an initiative to burn cordwood with new stoves and boilers instead of burning fuel oil in all remaining homes and structures.
20. Develop capacity and businesses to provide sustainable local wood products. This could include seasoned fire wood, milled house logs and lumber from Hazardous Fuel Reduction projects to Copper River Basin and Valdez markets.
21. Complete the Gakona Safe Power Project. Removing hazardous forest fuels from within 100 feet of the poles and line and all other power infrastructure.

22. Complete the Gakona Safe Village Phase #1 hazardous forest fuels from with 150 feet of values of risk in identified Hazardous Fuels Units. This will be thinning out the units with previous ladder and crown fuels removed to a 20-foot spacing between crowns.
23. Complete the Gakona Safe Village Phase #2 hazardous forest fuels the next 150 feet out from Phase #1 project in identified Hazardous Fuels Units.
24. Complete the Gakona Safe Village Phase #3 hazardous forest fuels the next 300 feet out from Phase #2 project in identified Hazardous Fuels Units.
25. Complete the Gakona Safe Village and Moose Habitat Enhancement project PLOD #1 as identified in the plan.
26. Complete the Gakona Safe Village and Moose Habitat Enhancement project PLOD #2 as identified in the plan.

This document provides the area background, fire history, risk assessment, proposed task list, and mitigation resources for the community of Gakona (Figure 1). Appendices for additional resources, proposed treatment maps, risk assessment/evaluation, and community details are included at the end of this CWPP.

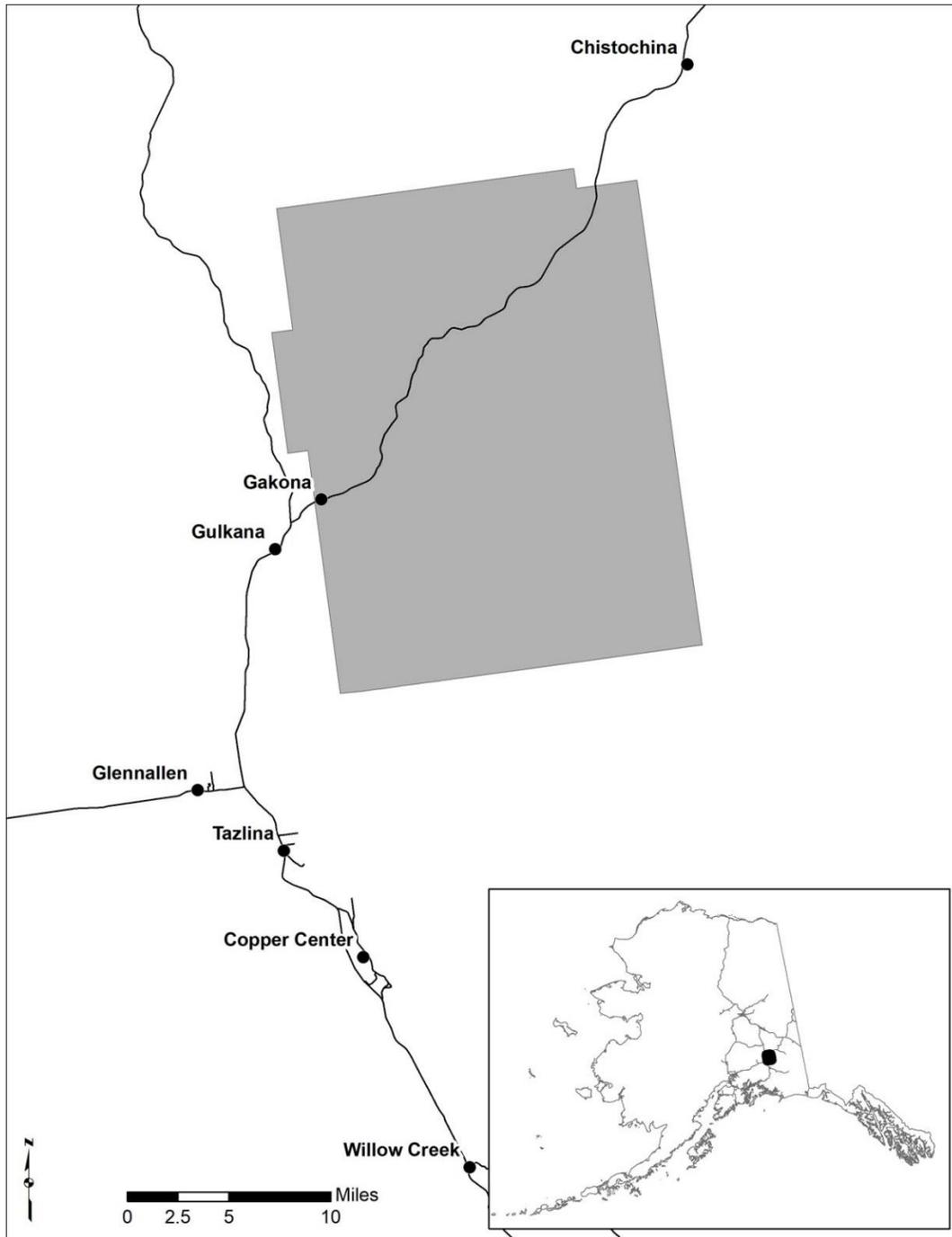


Figure 1. Gakona Fire Plan Area within the Copper Basin, Alaska.

Collaboration

The Gakona Community Wildfire Protection Plan (Gakona CWPP) is a collaborative effort between 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:

Gakona Village – The involvement of the Gakona 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 – Glenn-Rich VFD responds to fires in the area, and is a valuable local interest with an important role in wildfire mitigation efforts.

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 world's 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.

Gakona CWPP Planning Area

The Gakona Planning Area is located in the Copper Basin of Alaska and represents a land area of approximately 277,061 acres or 433 mi². The Fire Plan boundary spans 18 miles from north to south and 18 miles from east to west. Figure 1 identifies the actual boundary of the Fire Plan within the state of Alaska. The primary community within the Gakona Fire Plan region is Gakona, at the junction of the Gakona and Copper Rivers.

Community Profile

Community of Gakona

The Native Village of Gakona is located at the confluence of the Copper and Gakona Rivers in the Ahtna region of Alaska. Gakona means Rabbit River. The village lies at mile 4.8 on the Tok Cutoff just east of the Richardson Highway. NVG is a federally recognized Tribe, and the Gakona Village Council is the governing body for the village.

The Ahtna Region is a geographic area ranging from the Alaska Range to the northwest, the Wrangell-St. Elias mountain ranges to the west, the Chugach Mountains to the south, and the Talkeetna Mountains to the west. This area includes large portions land owned by the federal and state governments, and Alaska Native corporations. While the Ahtna Region is highway-accessible and fairly modernized, the Ahtna people continue to practice a customary and traditional lifestyle whenever possible. The Ahtna culture, values, and vision are inextricably tied to subsistence resources and support cultural customs and traditions that have existed for thousands of years.

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. Refer to Figure 7 and 8 for WUI within the Gakona planning area.

Location and Geographic Location

Gakona is located at 62°18'17"N 145°16'24"W (62.301940, -145.30194) (Sec. 18, T006N, R001E, Copper River Meridian). It is positioned in the center of Copper Valley, surrounded by mountains and the Copper

River. Gakona is approximately 15 miles (24 km) northeast of Glennallen. It lies at mile 2 on the Tok Cut-Off to the Glenn Highway, just east of the Richardson Highway and is a midway point between the Canada–US border and Anchorage, or midway between Tok and Glennallen.

Population

Table 1 represents the estimated population of the Fire Plan area according to data acquired by the U.S. Census Bureau in 2010. While the census area boundaries did not precisely represent the Fire Plan 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 Gakona Fire Plan area encompasses 277,061 acres. Figure 2 represents the primary ownership distribution within the Fire Plan area. Federal ownership comprises 25.9% of the land area, state of Alaska ownership comprises 0.1%, Ahtna, Inc. comprises 59.4%, Ahtna, Inc. selected lands comprises 9.1%, and other private ownership comprises 2.3%. Water within the region comprise 2.7% of the total Fire Plan area.

Table 1: Estimated population of fire plan area (Source: U.S. Census Bureau 2010).

Gakona	
Population	
Year-round occupants	218
Total Housing Units	
Occupied year-round	89
Seasonal, recreational or occasional use	21
Vacant	21
Total	131

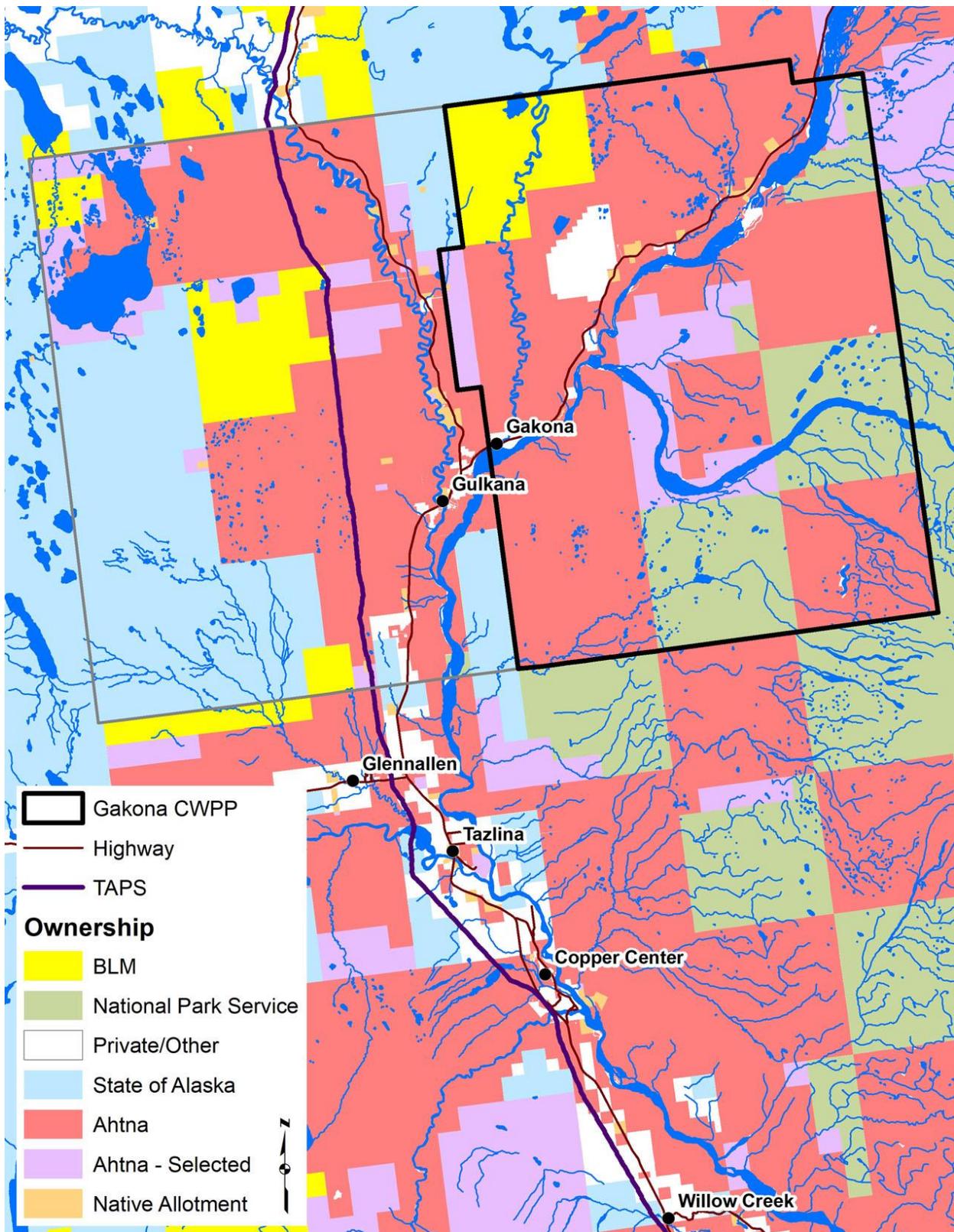


Figure 1. Land Ownership, Infrastructure, Primary Lakes, and Streams in the Gakona Fire Plan Area

Natural Fire Breaks

The occurrence of the Copper, Gulkana, and Gakona Rivers along with several large lakes represents the primary natural firebreaks within the Fire Plan area. In addition, Alaska Routes 1 and 4 may act as firebreaks during mild to moderate weather conditions. However, it is important to note that under more extreme or critical weather conditions (i.e., high temperatures, low humidity, and moderate to high winds), burning embers can be carried long distances and ignite fires on the other side of natural firebreaks.

Critical Facilities

Critical facilities are defined as facilities critical to government response and recovery before, during or after a wildfire. Critical facilities for the Gakona area include fire stations, public works facilities, medical centers, and shelters. Critical facilities also include those that are essential to the continued delivery of community services such as U.S. Postal Service facilities and community service centers. In the Village of Gakona critical facilities are the Community Hall, the Health Clinic, Child Advocacy Center (old School building), Fire Station, and Post Office.

Gakona Summarized Risk Assessment

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

- 1. Lack of Defensible Space for some private homes and 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 ingress and egress along 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 with islands and stands of hazardous forest fuels in the close proximity to the structure and should not be considered to be a safety zone or a safe evacuation location during a significant wildfire event in Gakona.
- 4. Loss of electricity post wildfire event.** 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. (Copper River Electric) 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.

- 5. Little to no firefighting equipment and personnel in the village for initial response to a wildfire.**
The IA response with equipment and personnel will be the Gakona VFD just a couple miles and minutes away. State of Alaska DOF response time for engines and personnel from Copper Center is 25 minutes if they are available and not on another fire response. Without proper response during conditions of high fire danger, the fire could quickly grow with little hope of containment before significant destruction would occur.
- 6. No evacuation and emergency response plan for a large fire in or adjacent to the village.**
- 7. 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.
- 8. The volume and congestion of hazardous forest fuels within ½ mile of the village.**
- 9. 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.

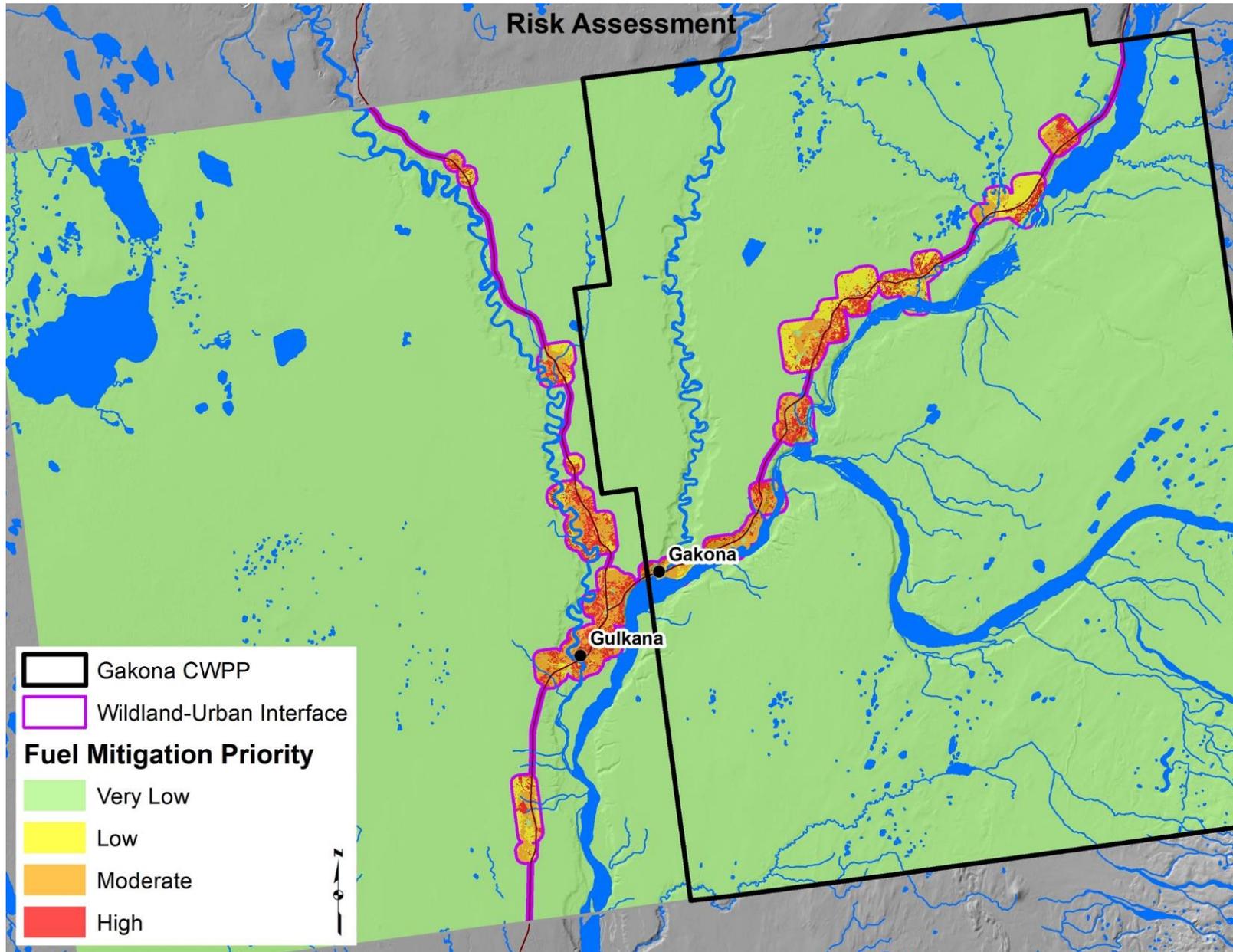


Figure 7. Fuels Risk Assessment, WUI Boundary, and CWPP Planning Area Boundary for Gakona.

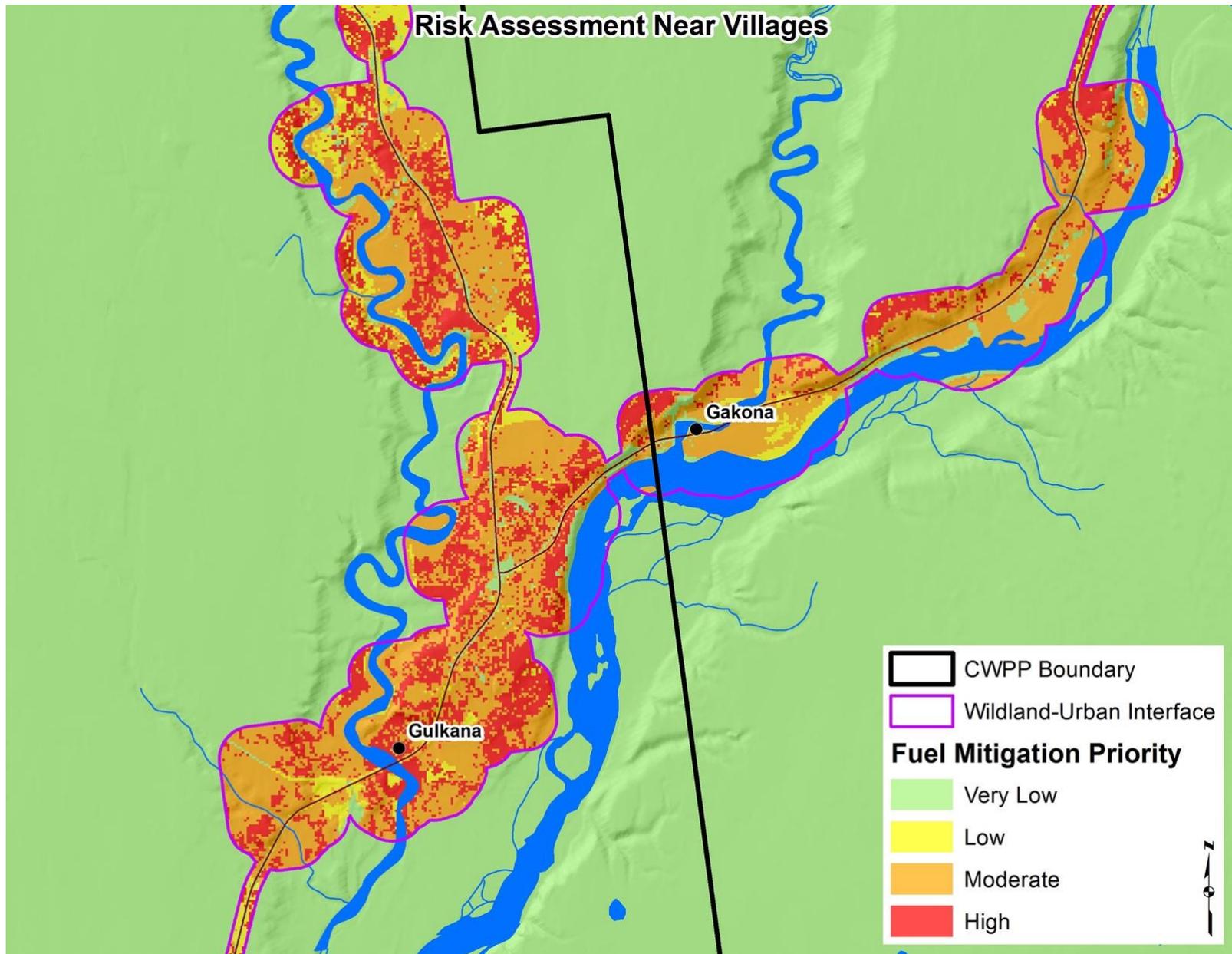


Figure 8. Close up of risk assessment and WUI boundary surrounding areas of Gakona and Gulkana.

The following, Table 3: Gakona CWPP Task Matrix, identifies solutions for each risk/concern listed in the previous section, proposed tasks to be completed to ensure proper risk mitigation, and potential entities that may address these tasks.

Table 2. Gakona CWPP Task Matrix.

Gakona CWPP Task Matrix		
Risk	Associated Tasks	Contacts/Responsible Entities
1. Lack of defensible space (including organic fuels, materials, household debris) for several private homes, structures and public structures.	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 materials clean up 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.	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.
2. Insufficient clearing for egress and ingress on most roads including the Glenn Highway.	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.	Village administrator, AITRC, AITRC contract forester, Ahtna Land Manager, AKDOT
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,

<p>4. Communication tower not safe from wildfire.</p>	<p>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.</p>	<p>Village administrator, AITRC, AITRC contract forester, Ahtna Land Manager, AK ETS, AK DOF, Cell Phone Company</p>
<p>5. Loss of electricity lines and infrastructure post-significant wildfire event.</p>	<p>1. Complete the Gakona Safe Power Project by removal of hazardous forest fuels from within 100 feet of the poles and line and all other power infrastructure.</p>	<p>Village Administrator, AITRC, AITRC contract forester, Ahtna Land Manager, Alaska Power & Telephone</p>
<p>6. Minimal firefighting equipment and personnel in the village for initial response to a wildfire.</p>	<p>1. Develop a Gakona 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.</p>	<p>Village Administrator, AITRC, AITRC contract forester, DOF, State Fire Marshal's Office</p>
<p>7. No evacuation and emergency response plan for a large fire in or adjacent to the village.</p>	<p>1. Develop and implement a Gakona emergency response plan using community, DOF collaborative group input. 2. Ensure the emergency response plan is easily accessible by community members and emergency personnel.</p>	<p>Village Administrator, AITRC, AITRC Contract Forester, DOF, VFD, Cooperators, AP&T, State DHS</p>
<p>8. The volume and congestion of hazardous forest fuels throughout and immediately surrounding the village.</p>	<p>1. Complete the Gakona Safe Village Phase #1 hazardous forest fuels from with 150 feet of values of risk in identified Hazardous Fuels Units. 2. Complete the Gakona Safe Village Phase #2 hazardous forest fuels the next 150 feet out from Phase #1 project in identified Hazardous Fuels Units. 3. Complete the Gakona Safe Village Phase #3 hazardous forest fuels the next 300 feet out from Phase #2 project in identified Hazardous Fuels Units.</p>	<p>Village Administrator, AITRC, AITRC Contract Forester, NRCS, Ahtna Land Manager</p>
<p>9. Little to no outreach and fire education programs in place.</p>	<p>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 3. Conduct yearly fire-prevention educational sessions in local schools.</p>	<p>Village Administrator, AITRC, AITRC Contract Forester, DOF, VFD, Cooperators, AP&T, State DHS</p>

<p>10. Maintaining a sustainable approach to fuel reduction and community independence.</p>	<ol style="list-style-type: none"> 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. Training for fuels shut off and disposal prior and during the event of a forest fire. 	<p>Village Administrator, AITRC, AITRC Contract Forester, NRCS, Ahtna Land Manager, SBA, AK Economic Development, REAP, US Department of Energy, Alaska Energy Authority</p>
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Appendix A – Detailed Treatment Maps and PLOD Maps

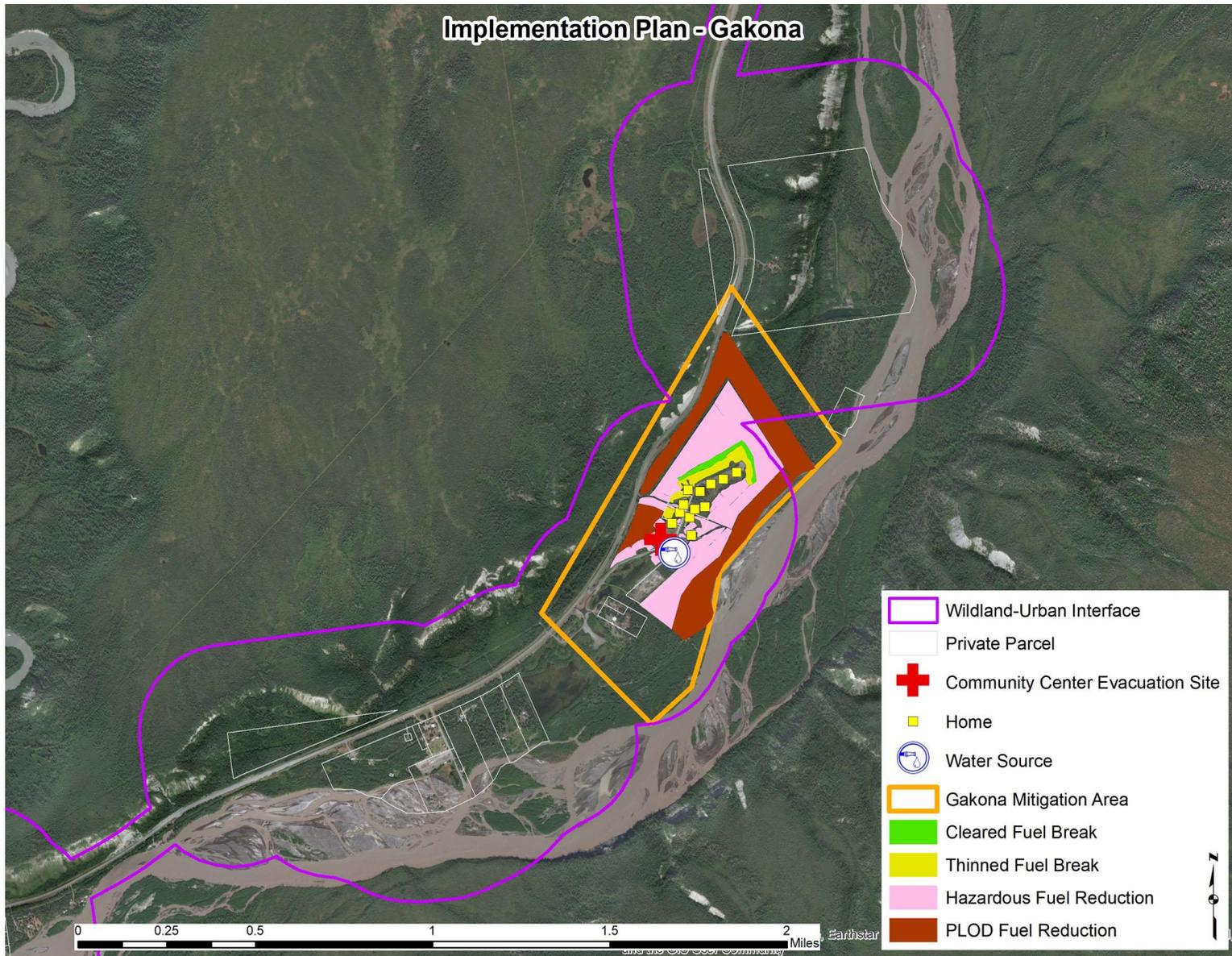


Figure A-1. Overview of Gakona Village, structures, completed treatments, and proposed treatment areas.

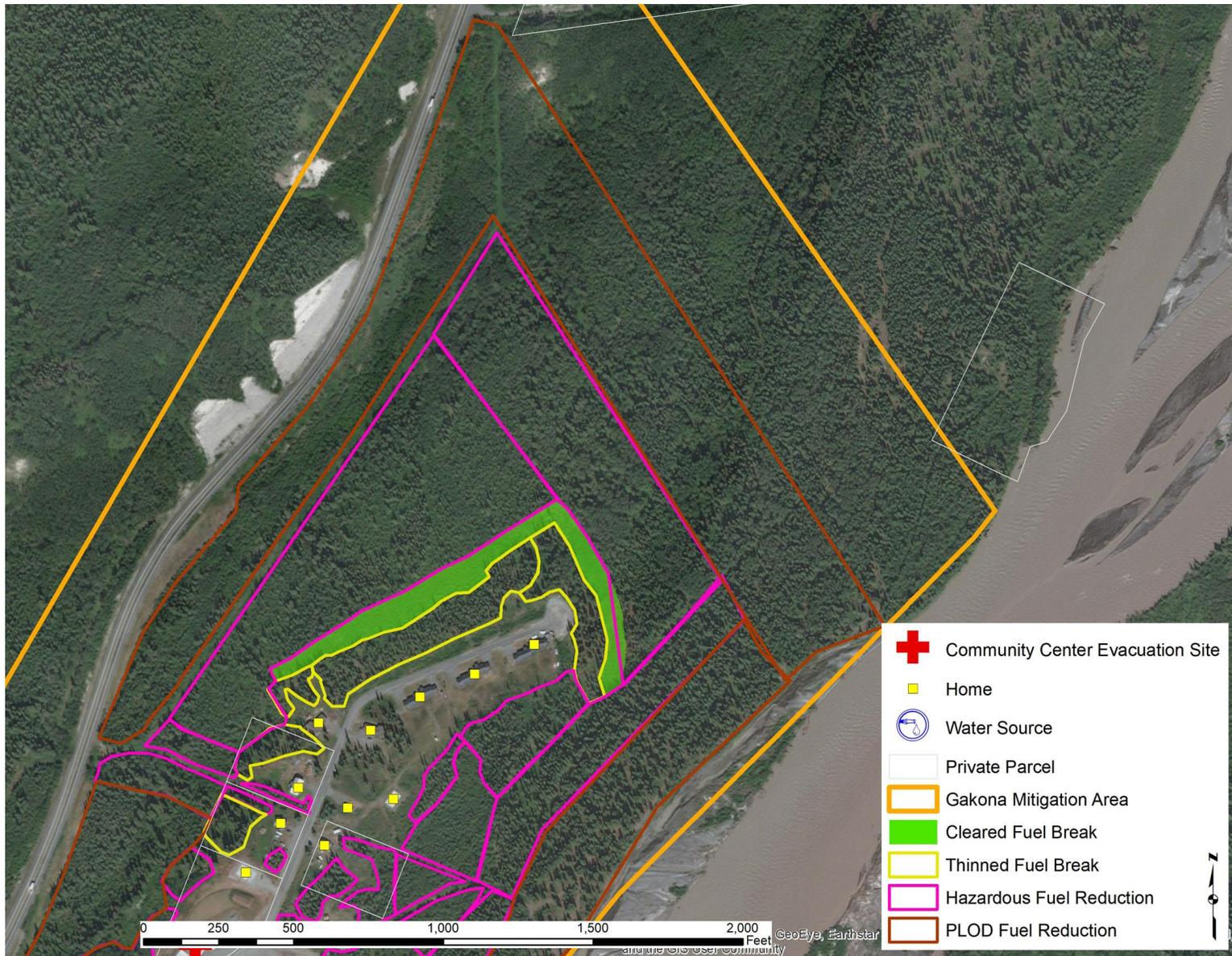


Figure A-2. Northern half of Gakona Village showing detailed implementation plan.

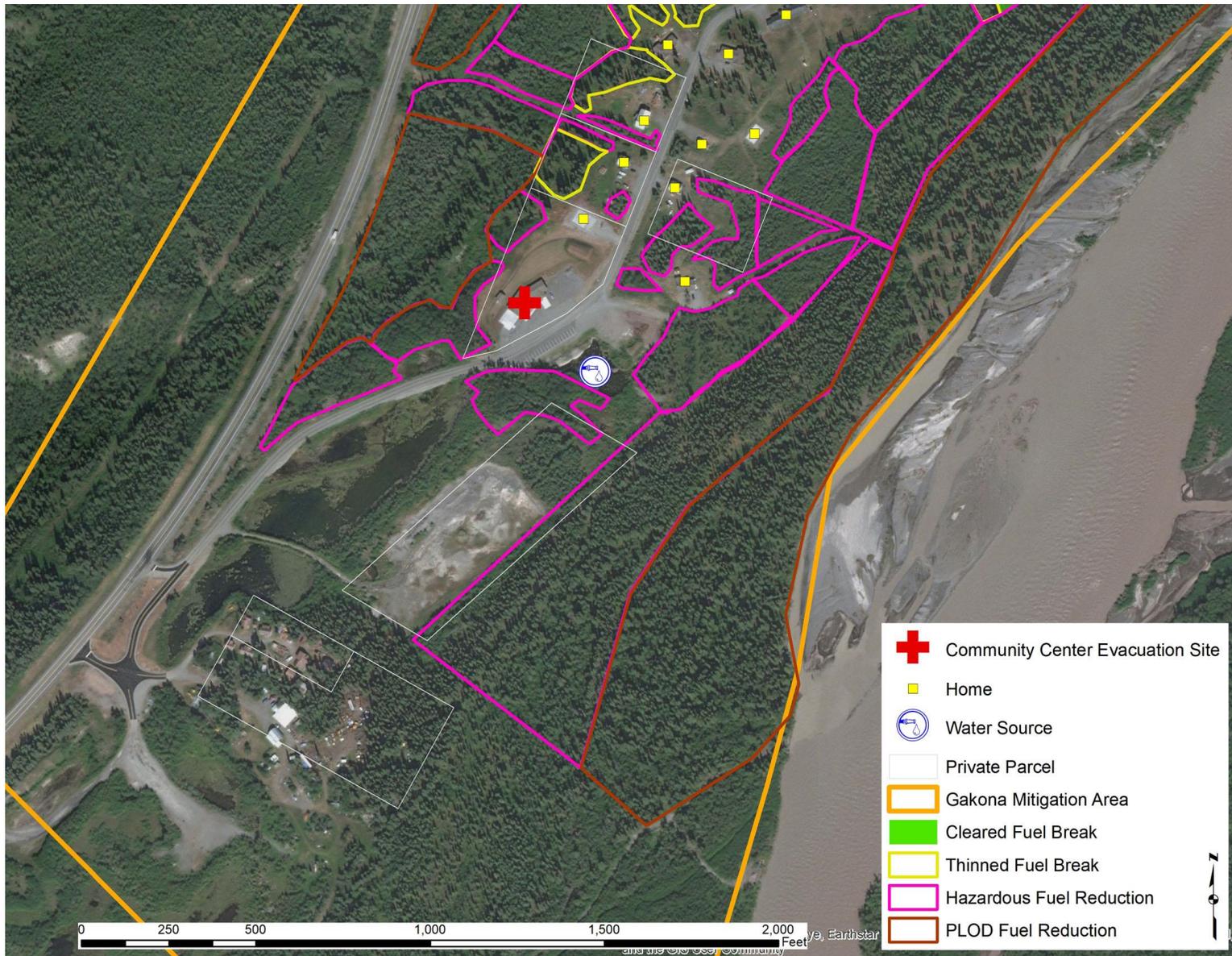


Figure A-3. Southern half of Gakona Village showing detailed implementation plan.

High and Moderate Risk Fuels

The results of the risk assessment identified a total of 5,025 acres in the category of high or moderate risk fuels within the WUI for the Gakona Fire Plan area. In addition, the PLOD occupies approximately 53 acres. Including the PLOD there are 5,065 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. Figure B-4 displays an overview of the projected PLOD areas and other treatment types in the planning area.

Table B-1: Risk Rating and PLOD acres by Landowner within Gakona CWPP Area

Land Management	PLOD	High	Moderate	Low	Very Low
Ahtna	53.3	1,449.72	1,630.52	1,509.53	253.24
Ahtna - Selected		0.57	4.43	3.07	2.51
State of Alaska		48.71	180.05	22.08	20.32
Native Allotment		266.40	257.89	486.17	44.95
Private		286.47	900.44	618.24	151.53

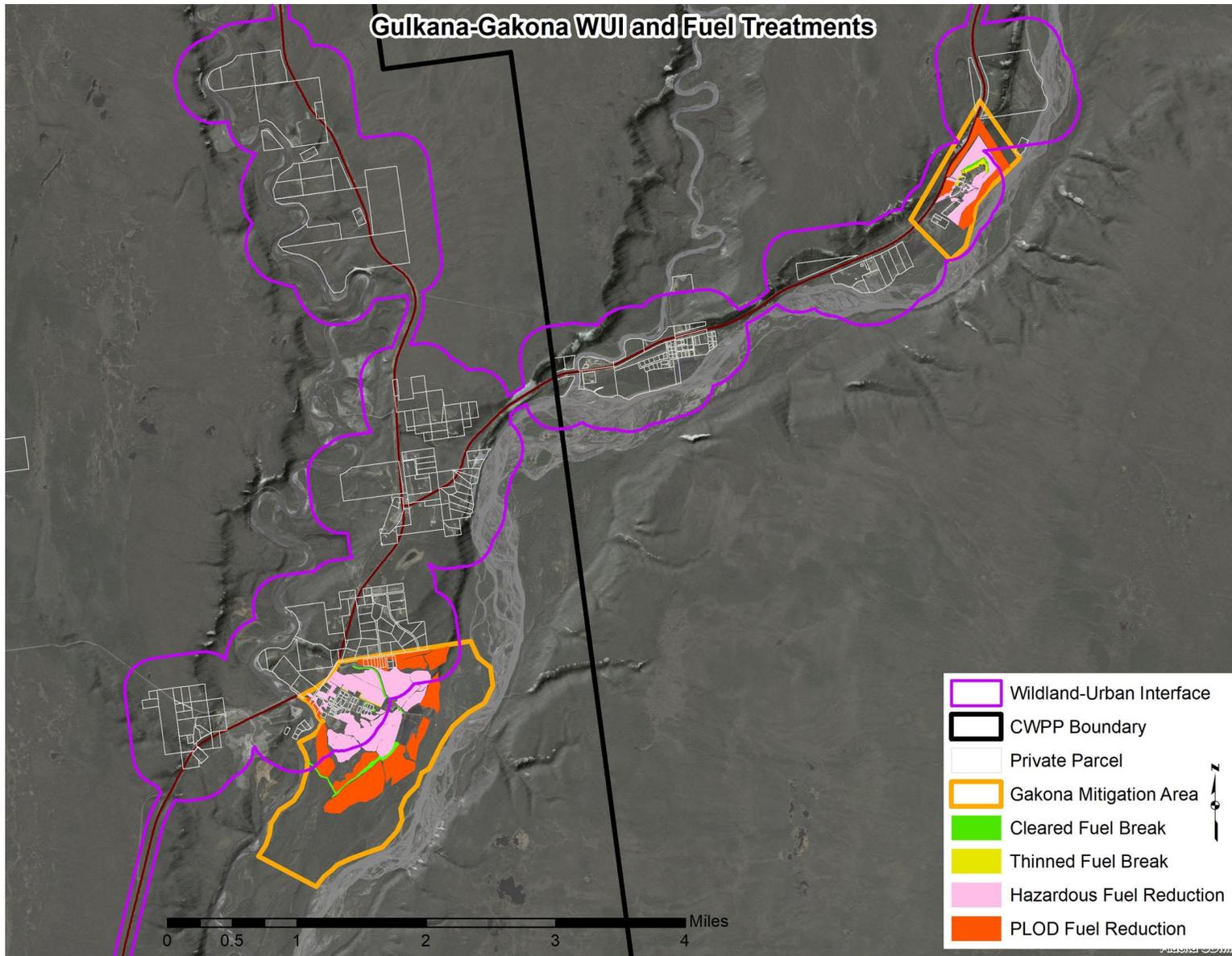


Figure B-4: Proposed treatment areas by type for Gakona fire plan area with SPOT background.

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

Table B-1. Reported wildland fires within the Gakona Fire Plan Area since 1940.

DATE	NAME	YEAR	MANAGEMENT	LATITUDE	LONGITUDE	ACRES	GENERAL		
							CAUSE	SPECIFIC CAUSE	
5/25/1940	Nebesna 1	1940		62.433334	-144.916671	0.1	Human	Incendiary	
8/2/1942	13 Mile	1942		62.400001	-145.116668	0.2	Human	Debris Burning	
6/28/1942	Ewans	1942		62.299999	-145.300003	0.1	Human	Smoking	
7/27/1942	None	1942		62.383335	-145.133331	0.1	Human	Debris Burning	
5/18/1943	Fox Lake	1943		62.433334	-144.983337	30	Human	Campfire	
4/19/1943	Gakona Hill	1943		62.299999	-145.266662	3.2	Human	Unknown	
6/16/1944	7 mile	1944		62.333332	-145.183334	0.1	Human	Campfire	
7/18/1944	4 Mile	1944		62.316665	-145.233337	0.1	Human	Miscellaneous	
7/24/1947	22 Mile Tok Road	1947		62.5	-144.916671	38500	Lightning	Lightning	
5/26/1949	Gakona	1949		62.299999	-145.300003	0	Human	Debris Burning	
5/16/1951	Slana River	1951		62.333332	-145.166671	60	Human	Campfire	
5/16/1951	Mile 12 Tok Road	1951		62.383335	-145.149993	5	Human	Miscellaneous	
8/23/1955	GAKONA SCHOOL FIRE	1955		62.299999	-145.300003	0.1	Human	Debris Burning	
9/17/1955	MP 20 TOK	1955		62.45	-144.916671	0.3	Human	Campfire	
7/19/1955	GAKONA	1955		62.299999	-145.233337	0.2	Human	Smoking	
6/1/1956	19 MILE	1956		62.433334	-144.949996	8	Human	SMOKING	
6/22/1958	20 MILE	1958		62.416667	-144.833328	1	Human	MISCELLANY	
6/7/1958	14 MILE	1958		62.383335	-145.050003	1	Human	CAMPFIRE	
7/1/1958	15 MILE	1958		62.416667	-145	2	Human	MISCELLANY	
7/4/1958	GULKANA VILLAGE #1	1958		62.299999	-145.300003	0.1	Human	SMOKING	
7/6/1958	GAKANA BANK	1958		62.299999	-145.199996	0.1	Human	MISCELLANY	
6/19/1959	GULKANA	1959		62.266666	-145.283334	3	Human	RECREATION	
6/13/1990	11.5 TOK RD	1990	MODIFIED	62.400001	-145.116668	0.1	Human	POWERLINE	
7/6/1990	FLATLAND	1990	MODIFIED	62.25	-145.266662	1.2	Lightning	LIGHTNING	
8/30/1990	TULSONA #2	1990	MODIFIED	62.400001	-145.083328	0.1	Human	VEHICLE	
6/5/1992	4.5 Mile Tok	1992	FULL	62.299999	-145.233337	0.1	Human	OTHER	
8/31/1993		302829	1993	FULL	62.299999	-145.266662	0.1	Human	WARMING FIRE
7/6/1996	LIL`TULSONA CK	1996	FULL	62.416667	-145	0.5	Human	BURNING BUILDING	

7/4/1996	FOX FARM LAKE	1996	LIMITED	62.333332	-144.766662	20	Lightning	LIGHTNING
5/17/1998	GAKONA	1998	FULL	62.3	-145.2667	0.1	Human	OTHER
9/10/2001	mile 24	2001	FULL	62.48333	-144.8167	0.1	Human	VEHICLE
5/27/2001	mile 8 tok road	2001	FULL	62.35	-145.15	0.1	Human	LAND CLEAR
7/28/2003	8 Mile Tok Rd.	2003	MODIFIED	62.36666	-145.1667	0.1	Human	
7/12/2005	Mile 4 Tok Cut-Off	2005	FULL	62.3	-145.25	0.1	Human	Power Line
6/26/2005	Fox Farm Lake	2005	LIMITED	62.35	-144.8667	53.2	Lightning	
10/1/2009	Six Mile Tok Cutoff	2009	FULL	62.328334	-145.199996	0.1	Human	Debris Burning
8/31/2012	Gakona	2012	CRITICAL	62.283333	-145.254166	0.1	Human	Debris Burning
9/25/2012	Gulkana Bridge	2012	CRITICAL	62.301583	-145.308083	0.1	Human	Miscellaneous
5/29/2013	Tok Cut Off 2 mile	2013	CRITICAL	62.302305	-145.294194	0.1	Human	Miscellaneous

Table B-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 B-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 Fire Plan area was combined with information on primary evacuation routes to produce a weighting prioritizing the vulnerability of the communities to wildfire risk (Figure D-3). Evacuation routes were based on a 100 meter buffer delineated on either side of Highway 1 and Highway 4. 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 Gakona area did not exceed 200 structures per square mile, so no areas were assigned a value greater than nine.

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

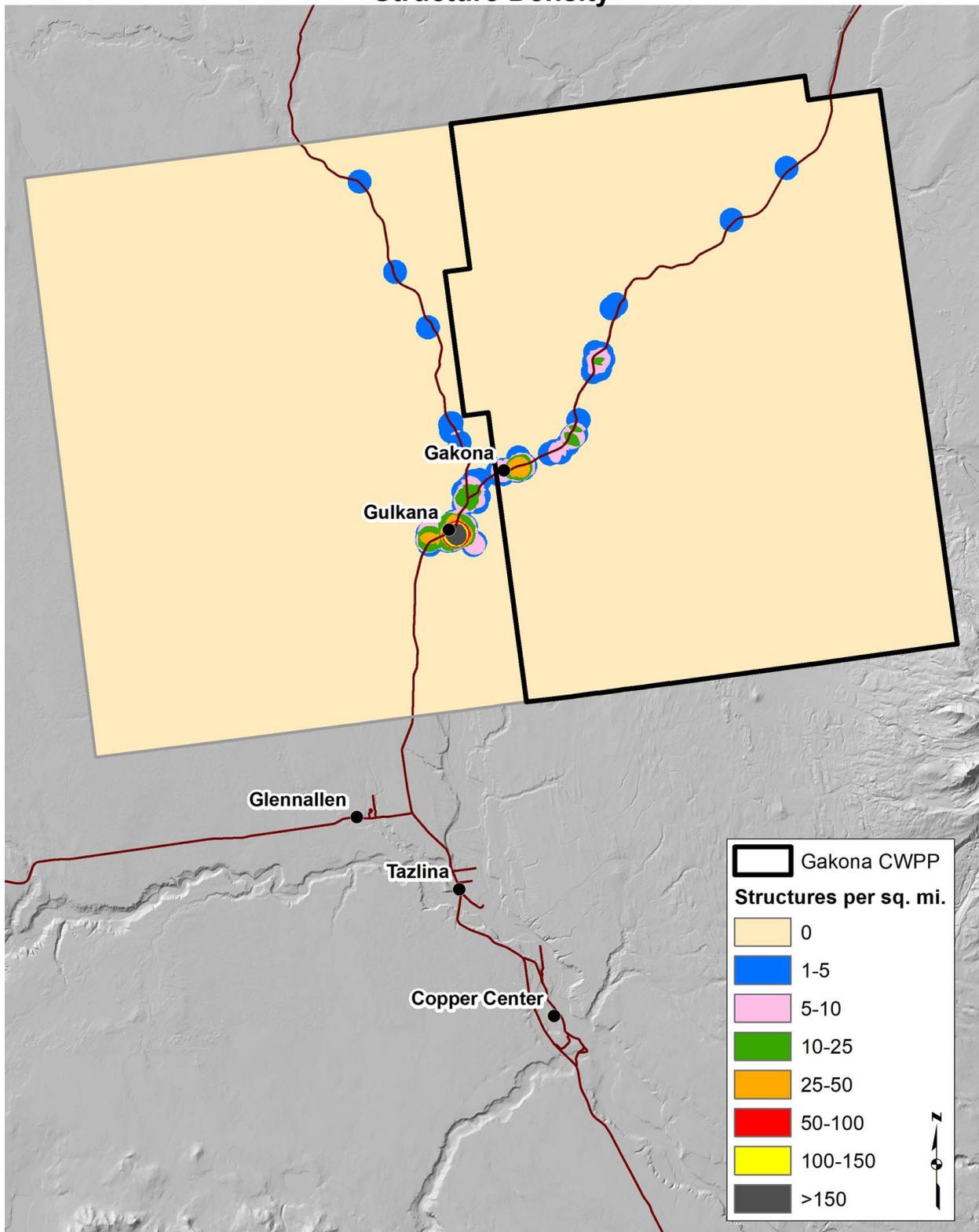


Figure D-3. Structure density in Gakona Fire Plan Area.

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 Fire Plan area represents portions of three primary watersheds: the lower Gulkana River Basin, the lower Gakona River Basin, and the lower Sanford River Basin. All of these watersheds form a part of the larger 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.

