FINAL

Stehekin Valley
Community Wildfire Protection Plan

April 2008

Prepared by
Concerned citizens of the Stehekin Valley
and the Cascadia Conservation District
with assistance from
North Cascades National Park,
Washington Department of Natural Resources,
Chelan County Fire District #10,
and United States Forest Service

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1. Introduction

Stehekin is a remote community different from any other in the lower 48 states. It is accessible to outside resources only by air, boat, or foot travel. The shortest trail into the community is approximately 18 miles long. The remoteness of the Stehekin Valley creates issues for timely access of sufficient fire fighting resources and efficiency of Jet A fuel availability. Stehekin abuts the north end of Lake Chelan and is surrounded by contiguous forest in the lower elevations. The area has had a number of significant wildfires and a history of fire suppression activities which have led to increased fuel loading and arboreal insect and disease issues.

Homeowners in the Stehekin Valley have been concerned about the effects of wildfire for some time. The Tolo (2007), Domke (2007), Flick Creek (2006), Shady (2005), Sisi Ridge (2004), Deep Harbor (2004), Rex Creek (2001), Glory (2001), and Flat Creek (2000) fires were in the immediate vicinity of the community. These events motivated residents of the valley to develop Chelan County Fire District #10 in 2007. Stehekin is also a federally listed "Community at Risk" for wildfire (Federal Register Vol.66 number 160 Aug 17, 2001).

Visions and Goals

The citizens value their homes, forested setting and privacy. Their overarching aim is to protect the community, its members, and essential infrastructure from fire through outreach, strategic planning and action. The primary goal of the Stehekin Valley Community Wildfire Protection Plan (CWPP) is to identify and implement projects that will protect people in the CWPP area, including residents, National Park staff, firefighters, visitors, and emergency personnel, from injury and loss of life. The secondary goal is to minimize or eliminate damage or loss of property and essential infrastructure due to wildfire.

Community Awareness

Residents of the Stehekin Valley area are very aware of the need to develop a CWPP. Recent large fires in the vicinity have affected the valley and highlighted the importance of developing a wildfire protection plan.

Most of the forest on both sides of Lake Chelan has burned in recent wildfires, leaving the forest surrounding Stehekin the last unburned area in the drainage. Stehekin has a predominant wind pattern of down valley in the summer months. The fires to the north and west of Stehekin were only able to be suppressed before entering Stehekin through aggressive firefighting efforts and favorable weather conditions. The fires that occurred to the north and west of Stehekin are not extensive and do not provide any significant amount of burned area to protect Stehekin from fires originating on the valley walls or the up valley side of Stehekin. Recent fires on the down valley side of Stehekin were pushed by down valley winds and are quite significant in acreage. More detail on recent large fires can be found beginning on page 9. A map of major fires since 1970 is included on page 12. It is clear that much of the upper valley is at risk to burn at higher than normal intensities due to high fuel loading.

The community has provided the energy, input and guidance essential for the creation of this document. Additionally, it is the hope of community members that residents and property owners of the area will start, or continue, efforts to make their properties as "FireWise" as possible and implement defensible space.

Values

Residents want to improve the safety of their community, and many individuals have already conducted work to reduce fuels around their homes. The assessed value of private structures in Stehekin Valley is approximately $25,000,000. The public infrastructure includes a hydroelectric power plant, above ground transmission lines, National Park Service Concessions, Visitor Center, campgrounds, bridges, maintenance facilities and associated housing. This infrastructure was estimated at $40,620,000 (Tolo Fire WFSA, 2007)

Through this CWPP effort the community hopes to provide input on land management decisions regarding adjacent National Park Service lands. This will be accomplished through the identification and review of planned and proposed projects on adjoining federal lands and through communication between the community and adjacent land managers.

2. Planning Area

The Stehekin Valley CWPP planning area sits at the north end of Lake Chelan. It is approximately 51,116 acres and includes the lower Stehekin Valley and surrounding area (see the Overview of Planning Area map on page 5). The planning area is surrounded by the Glacier Peak Wilderness, the North Cascades National Park Lake Chelan Recreation Area, and by the Lake Chelan Sawtooth Wilderness. The Chelan County Fire District #10 encompasses the Stehekin Valley as well as the lake shore down lake to Lucerne. The entire area within the planning boundary is considered to be Wildland/Urban Interface (WUI).

Private property comprises only about 1.9% (986 acres) of the planning area. In the Stehekin Valley proper, private property only makes up approximately 350 acres. The National Park Service (NPS) and the United States Forest Service (USFS) manage approximately 89% (45,686 acres). The school district (3.8 acres) and Chelan County Public Utility District (193 acres) also own land in the planning area. Lake Chelan makes up approximately 4,296 acres (8%) of the planning area.

General Description of the Area

Two roads, Stehekin Valley Road and Company Creek Road, provide access within the planning area. All the remaining roads are primarily private along with some park service roads and county roads with varying standards. Most of the roadways can accommodate structural fire vehicles. The majority of the area is in rugged terrain with many vertical cliffs and class 5 slopes, or greater than 70%.

The vast majority of the home sites do not include adequate defensible space although some work has been initiated by individuals and approximately 800 acres of fuels treatment, thinning and prescribed fire has been completed by the NPS. Some private lots and other areas within the planning area are stocked with heavy fuels.

Fuel types are primarily overstocked, mixed conifer types with some openings along the arid south slopes. Heavy riparian vegetation exists along streams. A couple small “safe zones” exist within the planning area. Citizens are instructed to congregate in the “safe zones” in the event of a fast-moving wildfire.

Power is provided by overhead power lines with only a few overhead connections to structures. Water resources are obtained from private wells, Lake Chelan, and the Stehekin River.

General Description of Existing Residential Areas

1) Upper Lakeshore

This area consists of both shores of Lake Chelan from the south end of the Stehekin Landing down the lake perimeter towards Lucerne. There are approximately 9 homes scattered along the lake in this area. Several campgrounds also exist including the Flick Creek, Moore Point, Meadow Creek, Manly-Wham, and Cascade Creek campgrounds.

2) Stehekin Landing
This is a recreational and mostly public area. There are approximately 25-30 buildings in the half to one mile stretch. One single lane road exists in this area, part of which is a parking area where the passenger boat docks. Most structures have metal roofs; a few buildings in the historic district have wood shake roofs. There are two overflow parking areas situated above the landing in two different spots. There is a 100,000 gallon water tank that supplies water to 14 hydrants in this landing area. The Purple Creek campground is also located in this area.

3) Head of Lake
This area includes the Weaver Point campground, nine homes, lake shore properties and marshland. Water is provided by wells, and the lake.

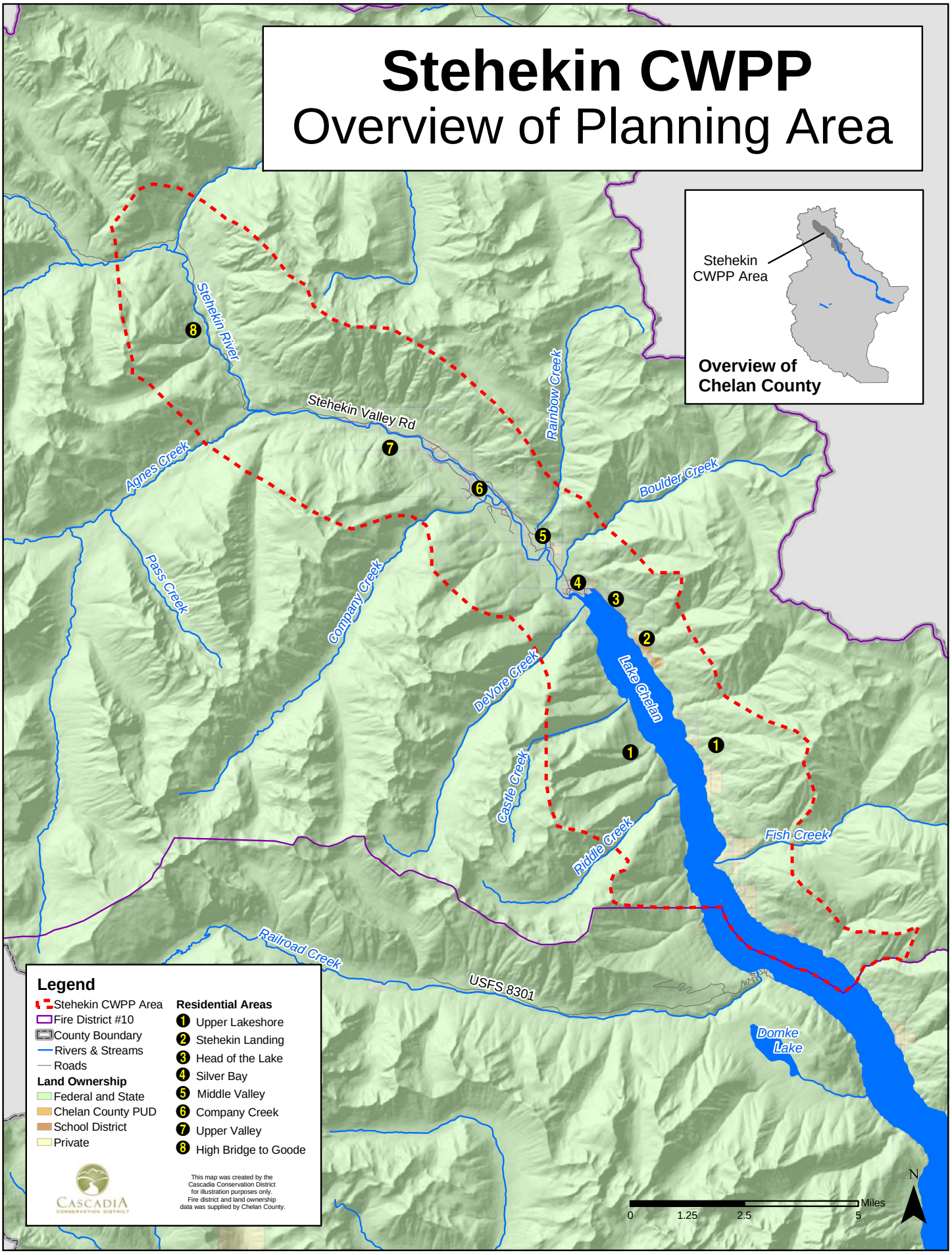
4) Silver Bay
This is a congested area with approximately 17-20 homes. Road access is by a narrow single lane road. Water is provided by wells and the lake.

5) Middle Valley
The area up valley from Silver Bay to Harlequin Bridge consists of 28 homes and associated outbuildings, a resort with approximately 8-10 cabins, a bakery, 6 rental cabins, the new and old school, gas purchase area, and a historic orchard with approximately 4 structures. The old school and most all of the structures at the orchard have shake roofs.

6) Company Creek
This area is across Harlequin Bridge from the Stehekin Valley Road and contains approximately 25 homes or outbuildings, as well as the Chelan County P.U. D. Hydroelectric plant, NPS maintenance yard and Harlequin Creek campground. The only road access is by the narrow 2-mile long Company Creek Road. Water is available via wells, Company Creek, Battalion Creek as well as from hydro pipeline spigots.

7) Upper Valley
This area extends along the Stehekin Valley Road above Harlequin Bridge to the Stehekin Valley Ranch. The area contains approximately 20 homes and associated outbuildings, as well as the Stehekin Valley Ranch which has a restaurant and numerous cabins and tent cabins for accommodating summer guests. It also contains one public campground and three shingle-roof structures.

8) High Bridge to Goode
This area extends along the Stehekin Valley Road from High Bridge to Goode and contains two shingle roof structures (PUD cabin and Bridge Creek cabin). It also contains two public campgrounds (Tumwater and Bridge Creek)


Stehekin CWPP
Overview of Planning Area
Stehekin CWPP Area
Overview of Chelan County
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Stehekin Valley Rd
Rainbow Creek
Agnes Creek
Boulder Creek
Pass Creek
Company Creek
DeVore Creek
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This map was created by the Cascadia Conservation District for illustration purposes only. Fire district and land ownership data was supplied by Chelan County.
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3. Planning Process

Background

The enactment of the Healthy Forest Restoration Act (HFRA) of 2003 created the opportunities for counties to participate in community-based forest planning and vegetation treatment project prioritization. This landmark legislation includes the first meaningful statutory incentives for the USFS and the Bureau of Land Management (BLM) to give consideration to the priorities of local communities as they develop and implement forest management and hazardous fuels reduction projects.

In order for communities to take full advantage of this opportunity, a CWPP must first be prepared. The Stehekin Valley CWPP is meant to conform to the intent and letter of HFRA. Once implemented, the CWPP should help reduce the risk of a catastrophic wildfire in this community.

The process of developing a CWPP is intended to help a community clarify and refine priorities for the protection of life, property, and critical infrastructure in the wildland-urban interface (WUI). It can also lead community members through valuable discussions regarding management options and implications for the surrounding watersheds.

The language in the HFRA provides flexibility for a community to determine the substance and detail of CWPPs and the procedures used to develop them. Because the legislation is general in nature, the Cascadia Conservation District is providing assistance in the preparation of this CWPP. CWPPs are being developed on the county fire district boundary scale in coordination with the landowners, fire district staff, and representatives of the United States Forest Service, Bureau of Land Management, and Washington State Department of Natural Resources. There are ten fire districts in Chelan County and CWPPs are being developed for each district. These CWPPs will be addendums to the Chelan County Community Wildfire Protection Plan. Priorities developed for private lands in each fire district will be prioritized and ranked in the county-wide plan.

The CWPPs for Chelan County will be updated as appropriate at a rate of no more than once every three years by the Cascadia Conservation District. It is expected that updates will be necessary in order to reflect work done to address issues identified in the CWPPs. Another important aspect of these plans will be the monitoring of effectiveness of implemented projects.

The Wildland-Urban interface (WUI) is the zone where structures and other human development meet and intermingle with undeveloped wildland or vegetative fuels. When wildfires burn through WUI zones they can pose tremendous risk to life, property, and infrastructure in associated communities and is one of the most dangerous and complicated situations firefighters face.

Both the National Fire Plan (2000) and the Ten-Year Comprehensive Strategy for Reducing Wildland Fire Risks to Communities and the Environment (2001) place a

priority on working collaboratively within communities in the WUI to reduce the risk to human life and high value infrastructure during large-scale wildfires.

The HFRA builds on existing efforts to restore healthy forest conditions near communities and essential community infrastructure by authorizing expedited environmental assessments, administrative appeals, and legal review for hazardous fuels projects on federal land. The Act emphasizes the need for federal agencies to work collaboratively with communities in developing hazardous fuel reduction projects, and it places priority on treatments identified by communities themselves in a CWPP.

The HFRA provides communities with a tremendous opportunity to influence where and how federal agencies implement fuels reduction projects on federal lands, and how additional federal funds may be distributed for projects on nonfederal lands. A CWPP is an effective way to take advantage of this opportunity.

The HFRA requires that three entities must mutually agree to the final contents of a CWPP including:

• The applicable local government (County or Cities)

• The local fire departments; and

• The state entity responsible for state managed forests.

In addition, these entities are directed to consult with and involve local representatives of the USFS, NPS, DNR and BLM and other interested parties or persons in the development of the plan. The process is open and collaborative, as described in the Ten Year Strategy (2001). Local and state officials, federal land managers, and a broad range of interested stakeholders are involved.

In the absence of a CWPP, the HFRA limits the WUI to within ½ mile of a community's boundary or within 1½ miles where mitigating circumstances exist, such as steep slopes or the presence of a critical evacuation route. Because of remoteness, steep slopes, heavy fuels, and limited evacuation options, the WUI in Stehekin extends beyond those standards up-valley to Bridge Creek, and from the Stehekin River, on either side to ridge tops at or around 6,000' in elevation. At least fifty percent of funds appropriated for projects under the HFRA must be used within the WUI as defined by either a CWPP or by the limited definition provided in the HFRA where no CWPP exists. For the Stehekin Valley CWPP, the WUI is within the entire project area.

Process and Partners

Residents of the Stehekin Valley have been concerned about wildland fire for many years. Recent fires in the area keep this concern alive. The current drought and recent low snow levels add to those concerns.

The Stehekin Valley CWPP is the result of locally-led efforts and partnerships between private, local, state and federal interests. The CWPP serves as part of the foundation for the county-wide wildfire protection plan that is currently being developed. By basing the county-wide plan on individual CWPPs such as the Stehekin Valley CWPP, the goals, objectives and recommended projects will be developed by and remain specific to each community. (See Section 8. Mitigation Action Plan on page 26).

4. Assessment

Existing Information

A substantial amount of data is already available from several sources. The fire and vegetation information, and GIS data used in this plan came from the Chelan County Assessor's Office, NPS and USFS Wenatchee-Okanogan National Forest, Chelan Ranger District.

Recent Fire History

The western United States is seeing a pattern of increasing wildfires, both in numbers and in size. This is the case in the North Cascades Complex, particularly in the areas surrounding Stehekin. The annual average snow pack amounts are decreasing and average summertime temperatures and durations are increasing. This, along with increased fuels beds, insect and disease-caused forest mortality and an aggressive suppression program have lead to an increase in fire frequency, fire intensity and size and size of unwanted fires in the Stehekin drainage.

Between 1973 and 1993 the complex experienced an average of three fires per year with a range of zero to nine fires per year. Between 1994 and 2006, the Complex has experienced a total of 132 fires. Of these fires, 50 have been south and east of Cascade Pass. The average number of fires per year for this period is ten with a range of 0-19 fires per year.

Table 1. Fires greater than 30 acres since 1994 within the North Cascades Complex, east and south of Cascade Pass. Fires of less than 30 acres are not included.

Date	Total Acreage	Name
July 1994	30	Rainbow
July 1994	50	Purple Mountain
July 1994	50	Butte Creek #3
July 1994	50	Butte Creek
July 1994	50	Purple Mountain #2
July 1994	50	Butte Creek #4
July 2005	109	Shady
August 2001	150	Rex Creek
July 1994	1000	Butte Creek #2
August 2001	1245	Glory Mountain
July 1994	5000	Little Boulder
July 2006	7879	Flick Creek
July 2007	350	Tolo

Boulder Fire Complex (1994)

In the winter of 1993 and 1994 snow pack was around 30% of average contributing to drought conditions across the west. Washington State had its biggest fire year in history known as the Tyee Complex which burned in the Wenatchee National Forest south of Stehekin. That summer, thirteen fire starts were reported around Stehekin. Four of the fires were brought under control in the initial attack stage. The other nine fires escaped

initial attack and grew to combine and form the Boulder Fire Complex (Little Boulder and War Creek fires). The intensity of the fire and steep terrain made it difficult for ground troops to be utilized along the fire's edge. Helicopter water drops were used to slow the spread of the fire and at the peak of suppression efforts 11 helicopters were being used to try and bring the fire under control. Rain finally helped slow the fire down permitting the use of ground resources. When the fire was finally extinguished nearly 5000 acres had burned. This fire was not included in the fire history map on page 12 because GIS data was not available.

Flat Creek and Glory Mountain fires (2000 and 2001)
Both of these fires were ignited by lightning during late July and early August thunder storms. Both fires started on adjacent Forest Service managed lands in steep wilderness terrain on south aspects. Suppression resources (smokejumpers and rappellers) were unable to safely attack either fire due to intense fire behavior and limited safe suppression options, both fires were managed under a containment strategy. Both fires burned down valley toward the Stehekin River, and uphill until running into natural fire breaks. Some helicopter bucket drops were required to prevent the fires from crossing Flat creek. Both fires burned until the middle of October and combined burned nearly 1800 acres. The Flat Creek fire remained on Forest Service managed lands; the Glory Mountain fire burned from Forest Service managed lands into the Park and burned to the Stehekin River. North aspects prevented fire spread due to high moisture content in the fuels and limited solar exposure.

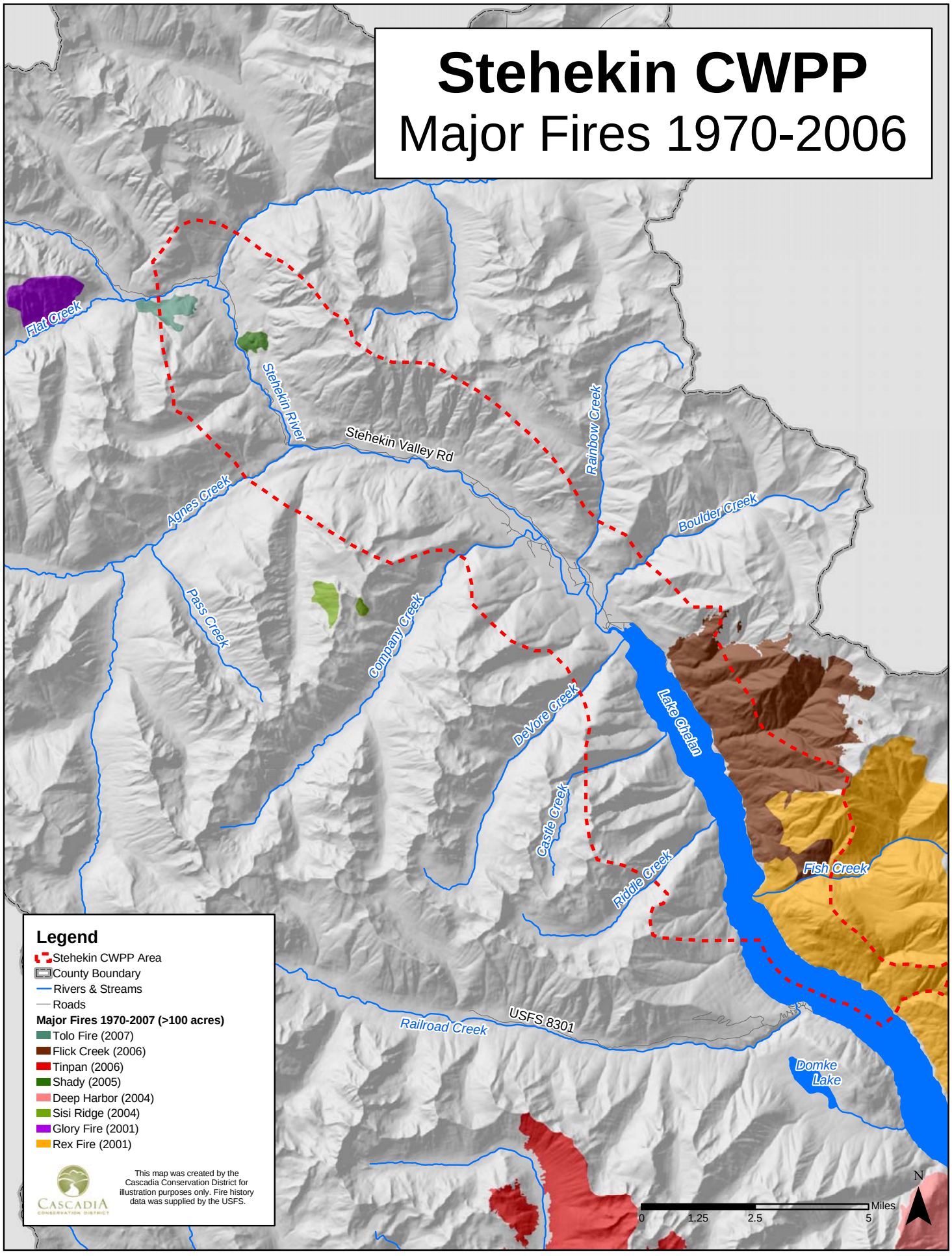
Shady Fire (2005)
On July 31, 2005, the Shady Fire was ignited by human activity along the Pacific Crest Trail. The fire started in a fairly flat area surrounded by heavy fuels. It was discovered around 2 PM and firefighting resources were immediately dispatched. Personnel were on site within an hour of discovery. Stehekin Valley Road had been washed out at Car Wash Falls making access to the area more difficult than usual. The fire rapidly spread through forest stands stocked with mistletoe brooms and undergrowth. One load of fire retardant was dropped on the southeast edge of the fire and crews worked day and night to construct a fire line. Favorable weather conditions and help from Type I, II, and III helicopters and additional ground crews helped bring the fire under control. Had it not been for the moderate terrain over the majority of the fire area, available resources, and two cloudy days, this fire would have been much larger. In the end, the fire came within two miles of the nearest structures, three miles of the nearest residences and burned a total of 109 acres.

Flick Creek Fire (2006)
On July 26, 2006 the Flick Creek Fire was ignited by an illegal campfire started outside of a designated campfire ring. The fire spread rapidly and encompassed nearly 1000 acres by nightfall. Firefighting resources were already stretched thin across the western United States when the fire started. As a result, only local resources from NPS and USFS were initially available to fight the fire. Thirty personnel provided 24 hour point protection of homes and structures along the lakeshore until further resources arrived. Local landowners assisted by protecting their own homes with pumps and hose lays.

Containment lines were laid around the fire, but not all of the fire could be contained due to the lack of adequate safety zones, escape routes and steep inaccessible terrain. The fire spotted over the ridge into the Hazard Creek area in late August. The fire spread eventually impacted the Stehekin Landing putting more homes and infrastructure at risk. Fuels reduction treatments (overstory thinning, understory thinning, and pile burning) in the Stehekin Landing area permitted firefighters to construct a direct fireline, and with the aid of an incoming rainstorm to completely contain the fire. By the time it was fully contained, the Flick Creek Fire had burned over 7800 acres. Fortunately, no homes or structures were lost in the blaze.

Tolo Fire (2007)

On July 13, 2007 a lighting storm ignited several fires on Tolo Mountain. One fire was discovered immediately and contained; another was discovered several hundred feet below the first fire shortly after it had been contained. The second fire was near the edge of a cliff. Firefighters did what they could to try and contain the fire, but embers had already ignited fuels below the cliff edge that were in an inaccessible area. About 3200 gals of water were dropped on the fire via helicopter, but the fire continued to spread as debris rolled downhill, and the fire was pushed by ridge top winds that exceeded 25 miles per hour. Based on the terrain and conditions the fire was expected to grow to 2,000-3,000 acres before it would be safely accessible to firefighters. Weather conditions grew cool and moist, however, and the Stehekin weather station recorded 0.76 inches of rain on July 18 and 19, and another 0.69 inches of rain on August 6. Firefighters working in extremely steep terrain were able to contain the south and east flanks of the fire and keep it from spreading toward the Stehekin valley. By the time the Tolo Fire was fully contained, it had burned over 350 acres.


Stehekin CWPP
Major Fires 1970-2006
Flat Creek
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Stehekin Valley Rd
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Boulder Creek
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Major Fires 1970-2007 (>100 acres)
Tolo Fire (2007)
Flick Creek (2006)
Tinpan (2006)
Shady (2005)
Deep Harbor (2004)
Sisi Ridge (2004)
Glory Fire (2001)
Rex Fire (2001)
This map was created by the Cascadia Conservation District for illustration purposes only. Fire history data was supplied by the USFS.
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Fire Ecology

The eastside Douglas fir cover type that occurs throughout the Stehekin Valley is the most xeric type on the North Cascades Complex and is comparable to the dry Douglas fir mixed conifer of the Rocky Mountains. It is best characterized by a fire regime I of mixed severity where stand replacing events occur infrequently (approximately every 100 years) and low severity fires occur more frequently. A survey of the Stehekin Valley confirmed that large stand replacing events occur at approximately 90 to 100-year intervals. However, since a long term fire history study has not been conducted in the Stehekin Valley, the overall fire frequency for low and high severity fire events must be based upon studies in dry Douglas fir forests that have been conducted nearby.

A recent 433-year fire history study of the Teanaway River drainage in Okanogan-Wenatchee National Forest (OWNF) determined that the median fire interval varied within a range of seven to 43 years and that larger fires occurred at intervals of one to 37 years. Another fire history study in OWNF compared two 300-year long records in the Nile and Mud Creek watersheds, revealing a mean fire free interval (MFFI) of seven years at both sites during the pre-settlement period (1700/1750-1860), a MFFI of 7.1 and 10.6 years respectively during the settlement era (1860–1910), and a MFFI of 38.3 and 43.0 years respectively during the suppression era (1910-1996).

Mean fire intervals may have been longer (12 + years) in Stehekin because Douglas fir typically dominates the over story in Stehekin, indicating that fire free intervals were long enough to allow Douglas fir to grow to ample size to survive low severity fire along with the more fire resistant ponderosa pine, whereas ponderosa pine was the dominant in the OWNF study areas.

The studies in the OWNF areas found fires historically to be variable in size and location. Small fires created gaps in the forest canopy that perpetuated a variety of fire effects; subsequent fires would burn up to, but not within, the perimeter of recently burned areas because the fuels were sparser in those areas. Larger fire events occurred in both study areas; however, historically these were not stand replacing fire events. High severity fires occurred at the stand scale (10-100 hectares) rather than at the landscape scale (>1000 hectares).

Both studies also found significantly longer fire free intervals in the suppression era. Fire suppression and/or other factors have increased ground fuels and under story regeneration beyond historic levels; forests of this type were fairly open, perhaps containing 50 trees per hectare and 15m ^{2} of basal area that was predominantly ponderosa pine, and having low levels of coarse woody debris.

Given the differences between Stehekin and OWNF, a cautious estimate of the number of fire returns that the Stehekin Valley has missed since 1910 is between two and four. The fire records database documents 117 fires that have been suppressed since 1958 in the Lake Chelan Recreation Area, and recent surveys have documented unnatural fuels buildup, insects, and disease as evidence of fire suppression. A heavy fuel loading

average of 31.5 tons per acre total fuel loading (7.4 woody debris, 24.1 litter and duff) and greater than 250 trees per hectare (of over story trees > 15 cm dbh) are currently found in the Stehekin Valley forest fuel reduction areas. These conditions are likely to create crown fires and high severity fire events. Due to these considerations, the eastside Douglas fir/ponderosa pine forests are classified as Condition Class 3.

Fire Regimes

Lodgepole Pine Fire Regime
The lodgepole pine fire regime in the Stehekin Valley is a mixed severity fire regime, which fits reasonably well in the fire regime IV category, in which high severity events where more than 75 percent of the stand is replaced occur at approximately 100-year intervals. There is typically a mix of low, moderate and high severity events, and fire frequency is not well documented. Due to widespread mountain pine beetle infestations in the lodgepole pine stands throughout the Bridge creek, Rainbow creek and several other areas in the Stehekin drainage, the heavy fuel loadings from dead or dying trees create the conditions most conducive to high severity fire events, especially if dry, hot, and windy conditions occur.

Lodgepole pine-dominated sites in the Stehekin Valley appear to be perpetuated by high severity fire events; lodgepole pine is the most likely pioneer following stand replacing events, and its continued dominance is reliant upon these high severity fires reducing competition from more shade tolerant species

Fire regimes in the Douglas fir/lodgepole pine and the lodgepole pine cover types are considered to be in Condition Class 2 because without the reintroduction of fire, the lodgepole pine and Douglas fir will be replaced by more shade tolerant species.

Subalpine Fire Regimes: Mountain Hemlock and Subalpine Fir
The fire regimes of the subalpine forest types, mountain hemlock and subalpine fir, are both classified as a fire regime V in which fire free intervals are greater than 200 years and where high fire severity fire creates stand replacement. The longest term fire history study (10,500 years) of a subalpine fire regime in North Cascades National Park was recently completed in a subalpine forest in the Thunder Creek basin. This reconstruction documents fire frequency fluctuations between 30 to 400 years throughout this time period.

Mountain hemlock and subalpine fir fuels are primarily National Forest Fire Laboratory (NFFL) fuel model 8 except for in open areas on ridge tops and near snowline that are NFFL fuel model 5 and on mountain slopes where heavy fuels accumulate in jackpots that are NFFL fuel model 10.

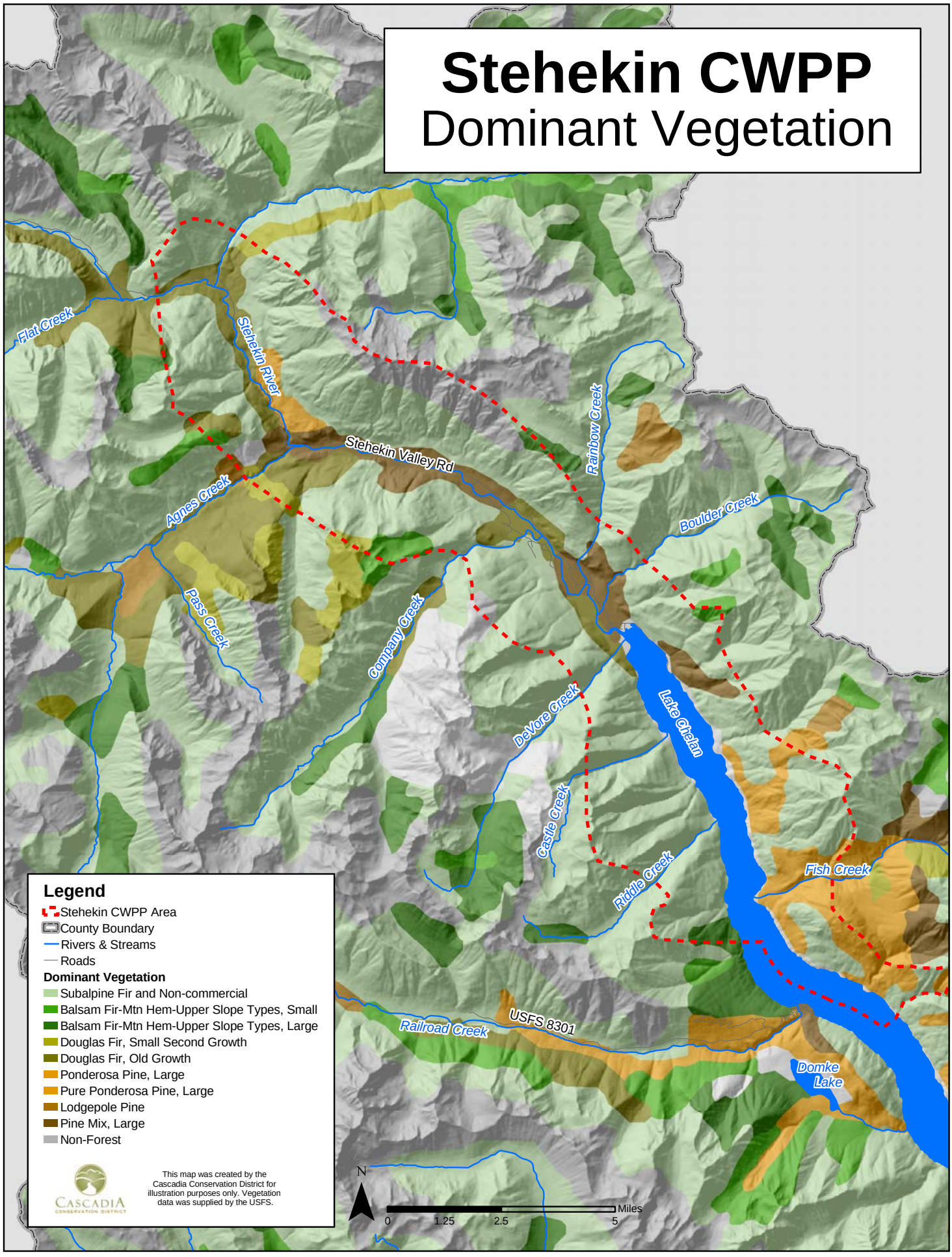
Fire intervals in whitebark pine/subalpine larch forests may be slightly shorter, and thus are classified in fire regime IV.

Whitebark pine/larch cover types are closest to models 8 and 1 although studies have found that both models overestimate fire behavior because fuel loadings are typically less than in model 8, and fuel moistures are typically greater than those of model 1 grasslands.

Subalpine meadow fire regime
The subalpine meadow fire regime is characterized by fire regime V. Fire events are infrequent because these meadows are typically moist from snowmelt and have very sparse ground fuels occurring around pioneer trees. Variable effects on heather and vaccinium recovery may be dependent upon the type of fire;

Drier eastside grass and sedge-dominated subalpine meadows may burn more frequently, as an abundance of charcoal has been found in the soil.

Shrub-dominated sites are an NFFL fuel model 5, and grass-dominated sites are an NFFL fuel model 1.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Balsam Fir-Mtn Hem-Upper Slope Types, Small
Balsam Fir-Mtn Hem-Upper Slope Types, Large
Douglas Fir, Small Second Growth
Douglas Fir, Old Growth
Ponderosa Pine, Large
Pure Ponderosa Pine, Large
Lodgepole Pine
Pine Mix, Large
Non-Forest
CASCADIA CONSERVATION DISTRICT
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Protection Capabilities

Chelan County Fire District #10 is responsible for fire protection in the Stehekin Valley and immediate down lake area. The Fire District was formed in 2006. The Washington State Department of Natural Resources has protection responsibility for undeveloped private lands in the valley. Through agreement, the NPS is responsible for protecting lands via state DNR taxes to protect within the Stehekin drainage. As of December 2007, Chelan County Fire District #10 shares this responsibility via the Forestland Fire Protection Agreement. The NPS has protection responsibility for land within Lake Chelan Recreation Area and North Cascades national Park, while the USFS has responsibility for land within the Glacier Peak Wilderness Area and the Chelan-Sawtooth Wilderness Area. Fire District #10 has responsibility for a large and remote area covering approximately 51,116 acres. The District does not have any paid employees, but has 13 motivated volunteers, a type 6 engine, and a fire chief. Since the district is so new, no fire station exists yet. However, the NPS does have a 20 person fire cache, a type 6 engine and a funded fire suppression program in Stehekin.

Continued development of other appropriate plans to improve protection capabilities will take place. Information gathered through the development of subsequent plans (such as mobility options and inventory resource list) will be made available to incoming support teams.

Strategy decisions shall take into account the following tactical considerations:

1. The Stehekin Valley is in a very fire-prone setting. It lies in a very remote setting accessible by boat or air. It contains steep valley walls that are heavily timbered and has an increasing amount of insects and disease including Douglas fir beetle, Mountain pine beetle and Spruce budworm. Fires would move rapidly through the area with a high probability of spotting, torching and crowning.

2. The primary consideration of the District is the protection of the lives of the residents and the safety of the firefighters.

3. The District practices a policy of aggressive initial attack. They are not trained to fight structure fires, but do their best to contain them and prevent them from spreading to adjacent forest lands.

4. While life safety and structural protection are the primary responsibilities of the District, they also respond to adjacent wildfires when the NPS needs assistance.

5. Wildfires escaping initial attack rapidly expand and require a multi-jurisdictional response. This requires joint training and communications. Currently there is a positive relationship between Fire District #10 and the NPS.

6. Chelan County Fire District #10 and its local partner cooperators cannot assemble enough structure protection capabilities to protect all the homes and infrastructure within the Stehekin Valley. Successful defense from wildfire will depend upon

structural triage, and time for pre-treatment with mobile tactics. Resources from state and federal agencies will be necessary to implement the strategies described. In the face of a fast moving or crown fire all efforts would be focused on evacuation of all residents and firefighters to safe zones

7. Private wells, Lake Chelan and several creeks including Hazard Creek, Purple Creek, Imus Creek, Boulder Creek, Rainbow Creek, Wilson Creek, Company Creek, and Battalion Creek provide water sources in the valley. Water can also be drafted from the Stehekin River or Lake Chelan at several known locations.

Structural Vulnerability

Residences within the Stehekin Valley are in a remote forested setting and many homes are entwined within the forested landscape. Access, topography, slope and fuels play a role in each structure's fire risk, as well as the condition of adjacent structures. Timber mixed with light fuels creates a fast moving fire situation with the highest potential for large fire loss. The close proximity of the structures, the limited escape route and lack of safe areas limit the amount of protection Fire District #10 can supply during a major wildfire event.

Key Contacts

Organization	Contact	Phone Number
Chelan County Fire District #10	Chief Bob Neilson	No phone
North Cascades National Park (Fire Management Officer)	Tod Johnson	(360) 854 7350
Chelan County Sheriff (evacuations)	Sheriff Mike Harum	(O) (509) 667-6851 (C) (509) 630-1700
	RiverCom	911/ (509) 667-6851
Chelan Ranger District (USFS)	FMO Marsh Haskins	(509) 682 2576
Central Washington Interagency Communications Center (CWICC)		(509) 662-4393
Chelan County PUD Office	Jim Gray	(509) 663-8121 (877) 783-8123 Emergency

5. Risk Evaluation

Access

Stehekin is a remote community accessible only by boat, air or foot. No roads provide access into the valley and only two roads, Stehekin Valley Road and Company Creek Road, provide access within the valley. Flooding in 2003 washed out the northernmost portion of the Stehekin Valley Road, further limiting access within the valley. Should a wildfire start or encroach from the north firefighting resources would only be able to access the area by foot or air. Through this CWPP, Fire District #10 and the concerned citizens of the Stehekin Valley recommend that the NPS restore and reopen Stehekin Valley Road to Bridge Creek for initial attack and suppression purposes.

The two roads within the valley are also designated as emergency evacuation routes. These roads pass through dense timber with forest canopy overhanging the roads in places. Neither road by themselves would provide adequate escape routes, but do provide fire and fuel breaks. Efforts are under way to remove hazard trees, understory trees, and ladder fuels along these roads so they can provide safe emergency evacuation routes. A description of this project can be found on page 22. The members of the CWPP committee unanimously agree that road corridor treatments should be the NPS Complex's highest fuels reduction priority. The majority of fires occur away from road corridors and are either accessible by air or hiking in extremely rugged terrain. Improvements or restoration of existing roads are the best way to improve access, response, and evacuation in the event of a wildfire.

Evacuation

Chelan County Emergency Management Program administers the evacuation of the Stehekin Valley. However, given the long distance and remoteness of the valley, Fire District #10 or other community members would potentially assist in an immediate, emergency evacuation of the valley. One item identified in the mitigation action plan portion of this plan is to work cooperatively with the NPS and Chelan County Sheriff's Department to establish an evacuation and structure protection plan and ensure that it is shared and respected by any and all incident commanders that are assigned to response teams in the planning area.

Staging Area

Chelan County Fire District #10 volunteers and the WDNR are the primary entities responsible for the management of fires on private lands in the Stehekin Valley. Chelan County Fire District #10 has a Forest Fire Protection Agreement which outlines jurisdictions. Due to remoteness, Fire District #10 is unable to have mutual aid agreements.

There are some locations in the valley that have served as staging areas during previous fires. Locations used in the past include; the Stehekin airstrip, the landing, fire cache (1/4 mile down valley from Stehekin Landing), lower field (7 ¼ miles up the Stehekin Valley Road), powerhouse parking lot, and the Stehekin Valley Ranch. The need for helicopter

fuel availability at a strategic location in the valley during fires has been identified as an issue that needs to be resolved.

Water Supplies

The location of water sources and the capabilities available for firefighting efforts has been identified. The Stehekin River or area creeks such as Rainbow, Boulder, Little Boulder, Company, Imus, Purple and Coon Creeks, can be accessed with a portable pump pushing water to engines or hose lays. Drafting sites directly from water sources by engines are limited to hydrants at the landing, Boulder Creek off of the Stehekin Valley Road, Stehekin River at Harlequin Campground, and Coon Creek. The majority of embankments have too much vertical relief for drafting by engines. Here, volume pumps will be required to fill engines with water.

Fuel Breaks and Safety Zones

Access is an issue. There is limited access to safe zones within the planning area and the single access road could easily be cut off by an approaching wildfire. The two safe zones in the valley include the Buckner Orchard and the Stehekin Valley Ranch. On the surrounding slopes there are a limited amount of safe zones for firefighters given the steepness of terrain and fuel loading. This situation is worsened by the increasing amount of insects and disease in the forest. Most of the Forest Fuels Reduction Areas, or FFRAs, (see Section 6. Current Activities for more information) are areas where survival is increased due to lowered fuel loads and good road access.

6. Current Activities

Protection Measures

Fire protection for the Stehekin Valley is provided by Chelan County Fire District #10, the NPS, and WDNR. Because of the extreme remoteness of much of the land within the planning area and limited availability of phones, response times can vary radically from 30 minutes to as long as several hours.

Existing Procedures

Fire District #10 and a number of residents from the valley have organized FireWise workshops to educate landowners about FireWise principles and practices. They have also conducted volunteer work parties to help implement FireWise strategies on private lands. Their efforts have helped to increase defensible space around homes and associated structures and decrease fuels loading on private lands.

Coordination with National Park Service

In order to maximize the efficiency of fuels reduction work on private land, it is desirable for complimentary projects to take place on adjacent NPS managed lands. This will be accomplished by identifying areas of concern to private landowners in the valley and providing feedback to the NPS (See Planned & Proposed Projects map on page 24). The CWPP is recognized as the instrument necessary to organize, educate and assist the public with the identification of projects that address wildfire concerns.

National Park Service Treatments

Since 1990, the NPS has recognized Stehekin as an at-risk community. They have performed fuels reduction efforts on over 1,300 acres including understory thinning on over 800 acres, large diameter thinning on almost 200 acres, and understory burning on over 1000 acres (800 acres total with some areas burned twice to restore historic fuel loads).

There is still quite a bit of fuels reduction work needed to help protect residents and private property in Stehekin from wildfire. The NPS is planning 124 acres of roadside thinning and hazard tree removal within the valley, about 3000 acres of prescribed burning in wilderness surrounding the valley, and an additional 322 acres in forest fuels reduction over the next 10 years.

This CWPP recognizes the importance of these projects but would like to stress that there is still more work needed in the CWPP area. Citizens unanimously agree that roadside thinning and potential obstruction removal should be the number one priority of the NPS. The group also proposes prescribed burning in Battalion Creek and up the valley from High Bridge to limit the spread of a fire to the Stehekin Valley and provide a measure of safety for firefighters by reducing the fire behavior potential of these areas and thereby increasing suppression success rates. Further, all areas currently not under consideration for treatment by the NPS or USFS should be treated with thinning and prescribed burning or with prescribed burning alone (if land is within wilderness designation).

Forest Fuel Reduction Areas

In the Stehekin Valley forest fuels reduction areas, a program of basal area reduction thinning is in the process of completion. These areas have had multiple treatments to reduce fuel loads by restoring fire into the ecosystem. To achieve the desired objectives a multi-stage approach including larger diameter thinning in a fire regime 1, condition class 3 forested area has been utilized where necessary. Fire regime 1 is where fire would normally occur most frequently of all the fire regimes. Condition class 3 is vegetation displaying the highest departure from the historic fire regime. Thinning for shaded fuel breaks is utilized where fire alone is either too dangerous to utilize or where restoration goals cannot be met with fire alone (Science Update PNW RS, 2002). Historic conditions of mixed conifer forests have been altered through the exclusion of fire (Hessburg et. al.1994).

Road Corridor: Escape Routes

Thinning of Understory Trees

Of the 124 acres of potential roadside treatments the majority are already inside forest fuels reduction areas and will be, or have already been, thinned under the 1995 Stehekin Forest Fuel Reduction and Firewood management Plan prescriptions. These prescriptions would be extended to roadside corridors outside of the forest fuels reduction areas to facilitate safe transport to the two safety zones in the valley (Buckner Orchard and Stehekin Valley Ranch) in the event of a major wildland fire. Thinning of understory trees (< 8 inches diameter) would limit the probability of a fire crossing the road, as well as reducing the heat from excess fuels along the roadside that may prohibit safe passage.

The prescription targets ladder fuels—small trees, or branches of larger trees, which provide vertical continuity between surface and canopy fuels—that enable fire to spread to tree crowns. Treatment of these trees may include cutting of understory trees and limbing of surrounding remnant trees.

Treatment of Potential Road Obstructions (PROs)

In addition to the roadside corridor treatment described above, treatment of potential road obstructions (PROs) will be performed. This treatment targets trees along the Stehekin Valley and Company Creek Roads that have a high probability of creating multiple obstructions in a wildfire event. It would be difficult to completely eliminate this potential; however there are about 100 trees in the 124 acres that have a high probability of falling or dropping tree tops or large mistletoe brooms on the road during a wildfire.

Prescribed Fire Units

Stehekin Contours Units

These units are designed to protect the wildland-urban interface areas of Stehekin. Larger scale burning will complement the FFRAs already present in the Stehekin Valley. Units on the valley walls tie into the FFRAs providing added fire protection from fire moving down valley. These upland areas carry fire readily both because the sites are drier and from years of effective fire suppression. Weather history data shows summer

wind patterns are likely to push a fire down valley with the zone of influence extending to 2200 feet in elevation (the lower valley floor sits between 1,150 feet at the Stehekin Landing and 1,800 feet at High Bridge). Fires igniting on slopes above the valley floor will also travel downhill readily from material rolling down the steep slopes surrounding Stehekin. The project is expected to occur over a 6 year period. One unit will be burned each year.

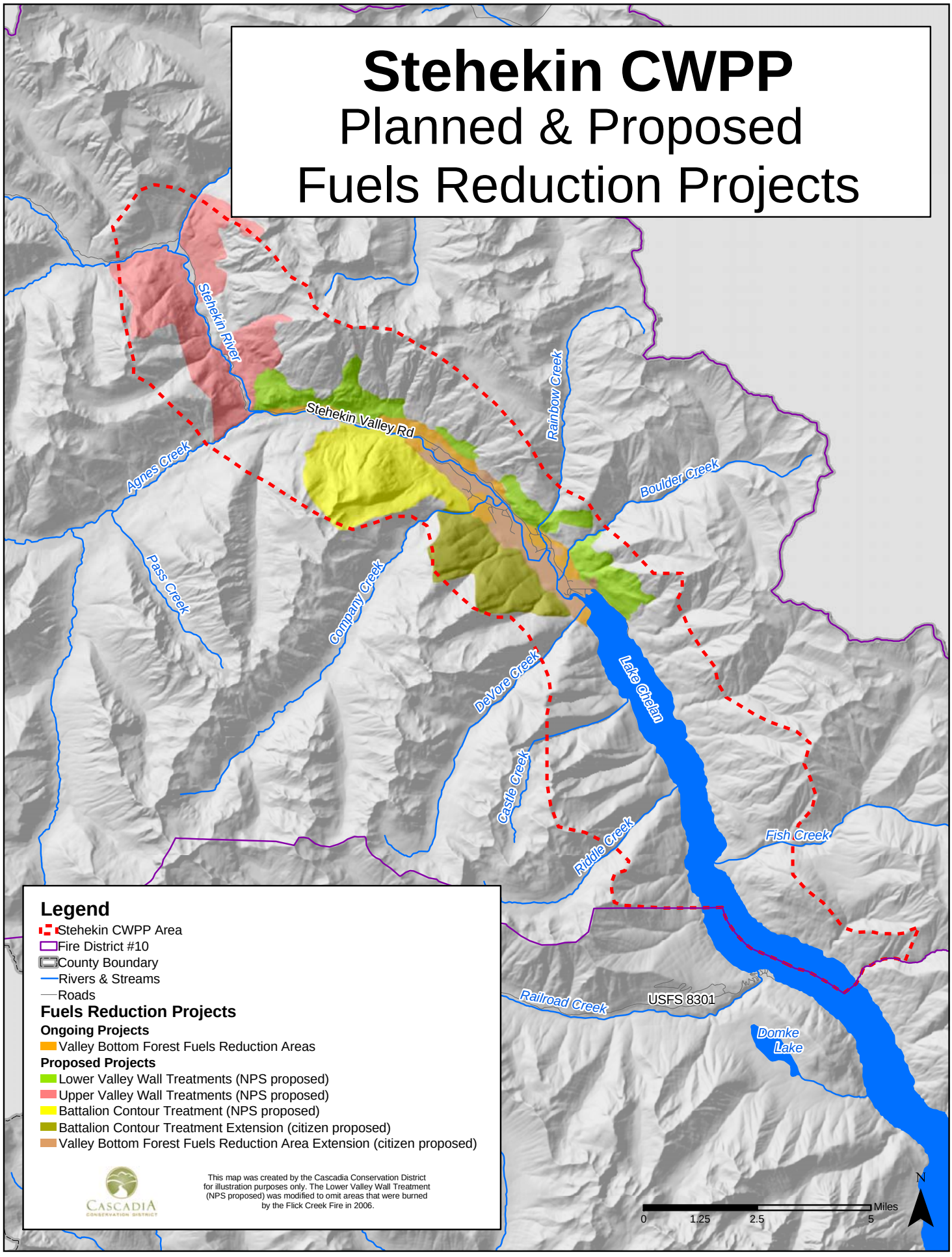
Table 2. Completed, planned or proposed contours prescribed fire units in the Stehekin CWPP area.

Stehekin Contours Prescribed Fire Units		Acres
Ranch		400
Coon Lake		569
Lower Field		444
Wilsey		338
Upper Rainbow		610
Upper Boulder		309
Buehler		663
Imus Creek	Burned during Flick Creek Fire	269
Hazard Creek	Burned during Flick Creek Fire	910
Maxwell	Burned during Flick Creek Fire	409
Flick Creek	Burned during Flick Creek Fire	400
	Totals	**4,848**
	New total based on units burned in Flick Fire	**3,333**

Fire District #10

The District elicited feedback from community members during the development of this CWPP. It was decided by the committee that the focus of this CWPP is to help ensure human safety and structure protection on private lands. Based on this, committee members decided to have the Mitigation Action Plan concentrate on safety issues in the following categories: fuels reduction, education and outreach, and improved protection capabilities. Projects that address human safety issues will be of a higher priority than projects that benefit homes. No home is worth more than a life.

Fire District #10, with the support of county, state, and federal partners, will assist with investigating and prioritizing future wildfire prevention and protection projects in the Stehekin Valley not already identified in this plan. In general, projects will be prioritized based upon their proximity to densely developed areas within the planning area and work outward toward adjacent public lands. The focus will first be on protecting areas of densest developments within the planning area.


Stehekin CWPP
Planned & Proposed
Fuels Reduction Projects
Stehekin River
Stehekin Valley Rd
Rainbow Creek
Agnes Creek
Boulder Creek
Pass Creek
Company Creek
DeVore Creek
Lake Chelan
Castle Creek
Riddle Creek
Fish Creek
Railroad Creek
USFS 8301
Domke Lake
Legend
Stehekin CWPP Area
Fire District #10
County Boundary
Rivers & Streams
Roads
Fuels Reduction Projects
Ongoing Projects
Valley Bottom Forest Fuels Reduction Areas
Proposed Projects
Lower Valley Wall Treatments (NPS proposed)
Upper Valley Wall Treatments (NPS proposed)
Battalion Contour Treatment (NPS proposed)
Battalion Contour Treatment Extension (citizen proposed)
Valley Bottom Forest Fuels Reduction Area Extension (citizen proposed)
CASCADIA CONSERVATION DISTRICT
This map was created by the Cascadia Conservation District for illustration purposes only. The Lower Valley Wall Treatment (NPS proposed) was modified to omit areas that were burned by the Flick Creek Fire in 2006.
N
0
1.25
2.5
5
Miles

7. Plan Maintenance

Fire District #10 staff will be responsible for monitoring existing projects and coordinating future projects aimed at wildfire prevention and protection within the Stehekin Valley CWPP area. Fire District #10 is also responsible for partnering with appropriate agencies to review and update this CWPP as appropriate in cooperation with the National Park Service, Cascadia Conservation District, Department of Natural Resources and the Chelan Ranger District. Maintenance of specific projects implemented through this plan will be identified as part of the project proposal.

8. Mitigation Action Plan

The priorities of Stehekin Valley residents are to reduce fuels along all roads and driveways in the planning area to allow for safe passage for emergency evacuation (see Planned and Proposed Projects map on page 24). The objectives of the items identified in the Mitigation Action Plan are to improve the safety of life and property in the Stehekin Valley and surrounding area. Additional priorities are the training of the volunteer fire staff, establishment of a fire station and purchase of fire fighting equipment.

There are three main categories of mitigation actions identified by the community. Categories include fuels reduction, education and outreach, and fire prevention and suppression in the planning area. Recommendations are organized into categories and are listed in order of priority.

- Fuels Reduction

    1. Reduce fuel loads and hazard trees at a minimum of 100' from center line of all roads and driveways so that they can serve as emergency evacuation routes. Highest priority roads are: 1) Company Creek Road to Harlequin Bridge, and Stehekin Valley road from Harlequin Bridge to Stehekin Valley Ranch, 2) Stehekin Valley road from Harlequin Bridge to Stehekin Landing, 3) Stehekin Valley Road from High Bridge to Bridge Creek.

    2. Continue to encourage homeowners to reduce fuels and implement FireWise recommendations 200 feet around homes and structures, working in partnership with the NPS.

    3. Encourage the National Park Service to continue current fuels reduction activities at the landscape scale with an emphasis of restoration of a low intensity fire regime and the creation and maintenance of strategic fuel breaks that will enhance local fire suppression efforts and utilize "natural" fuel breaks where feasible (such as ridge tops, rock outcrops and roads).

    4. Remove old unoccupied, unused NPS shacks/buildings in the valley.

- Education and Outreach

    1. Participate with National Park Service fuels reduction efforts. Community members will work with the National Park Service to pursue fuels treatments on lands managed by NPS that complement fuels reduction efforts on adjacent private lands. Public lands nearest to private property should have the highest priority for fuels reduction efforts. Opportunities to incorporate cooperative agreements should be pursued.

2. Continue annual work parties that implement fuels reduction efforts around homes.

- Improving Protection Capabilities/Human Safety

1. Reopen and maintain the upper valley road between Car Wash Falls and Cottonwood for access during fuels reduction, initial attack and suppression, and/or emergency evacuation.

2. Secure and make available structure fire protection materials to homeowners. Including, but not limited to foam and/or house wrap.

3. Provide training opportunities for the volunteer fire department staff with goals of establishing eventual structure protection capability and training local residents to fulfill specific logistical roles especially in times of Incident Command transitions. Includes the establishment and training of an initial attack team of local volunteers that respond to any fire, regardless of jurisdiction, within 12 hours of ignition and within reach by foot or vehicle if the fire occurs in a location where suppression is appropriate.

4. Obtain fire fighting equipment (vehicles, hand tools and radios).

5. Coordinate with local contractors for the transportation of personnel and equipment during major fire events. Inventory location of local private and public resources and document compatibility for use during fire events.

6. Work cooperatively with the NPS and Chelan County Sheriff's Department to establish an evacuation and structure protection plan and make available to landowners and public.

7. Evaluate opportunities of re-establishing access into historic and surveyed roads for safety and fire fighting purposes.

8. Obtain land and build a station for the Fire District.