



Forest Service Recreation & Natural Resources Briefing Paper

Date: October 24, 2012

Topic: Clearing after the Devil's Windstorm - Cutting Blowdown Trees from Trails, Inyo National Forest, California.

Executive Summary:

On November 30, 2011 the Devil's Windstorm tore through the Mammoth and Mono Lake Ranger Districts of the Inyo National Forest. The worst storm damage centered on Mammoth Ranger District in Reds Meadow Valley where over 400,000 trees were toppled by 180 mile per hour winds.¹ Public access to the Pacific Crest and John Muir Trails, as well as the access road and developed recreation sites in the Red's Meadow Valley, was severely obstructed. Inyo National Forest (NF) successfully mitigated the damage created by this blowdown through a rapid response with leadership emphasis and priority, strategic planning, coordinated teamwork and generous partner contributions.

In January Forest staff completed a rapid assessment of trail conditions resulting from the blowdown. This preliminary field inventory enabled the District to prepare a strategic plan for clearing blowdown on trails, including an itemized request for additional trail funding, and the types and numbers of crews needed to complete the work. This winter trail assessment also provided the base data to analyze the costs and benefits of various methods for clearing the trees from system trails using the framework of a Minimum Requirements Decision Guide.

During the summer of 2012, over 175 personnel, including both Forest Service employees and volunteers, cleared 290 trail miles of 4700 down trees. This monumental effort included both chainsaw and crosscut saw work. Crew labor amounted to over 29,600 person-hours at a value of \$617,160. Sixty percent of this work was accomplished through generous contributions from partner organizations and volunteers.

The Forest's rapid response enabled successful clearing of the Pacific Crest, John Muir and other trails in time for thru-hiker and forest visitor use during summer 2012. Trail clearing provided watershed resource benefits by preventing damage from user-created routes around blowdown. Trail clearing also facilitated support of the tourist-based economy in the nearby resort town of Mammoth Lakes, as a result of visitor patronage at local businesses.

Even with this monumental success, there remain challenges in budgeting and planning for a continuation of trail work in 2013. With the first fall 2012 storms, wind-weakened trees are being blown down on trails, which will necessitate additional clearing next year. Repair of trail tread and structures will also be needed next summer. Inyo NF will be seeking to leverage funds and partners for this work in 2013.

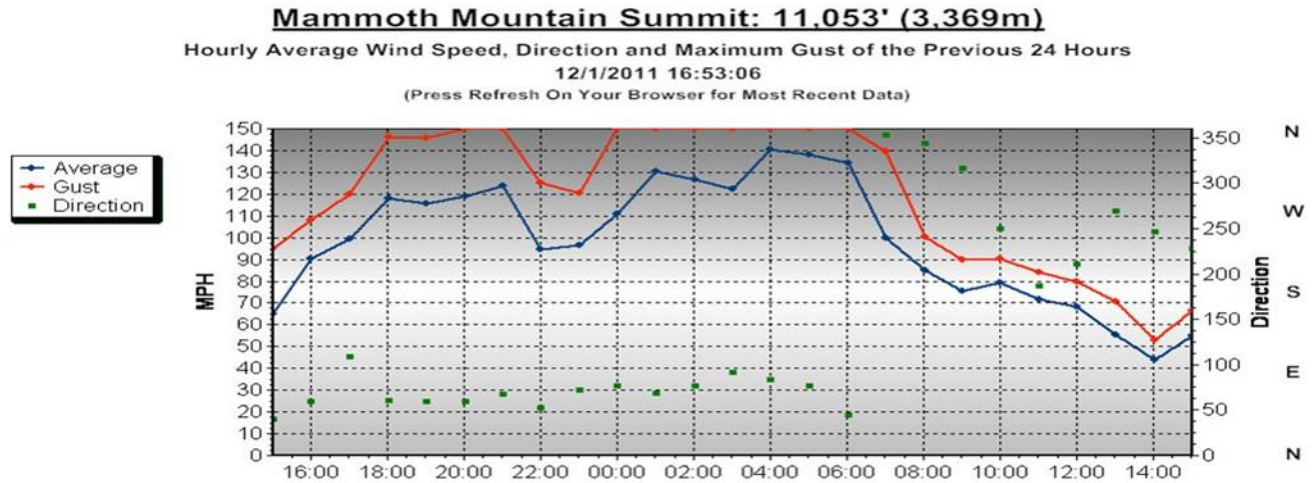
¹ Tree estimate was made by Vegetation and Wilderness Managers based on Timber plot data. See section "Wind Event" for specific wind speeds.

The Devil's Windstorm – What Happened:

The Devil's Windstorm blew down over 400,000 trees across the Sierra between November 30 and December 1, 2011. The National Weather Service has attributed the cause of the wind event to an extreme pressure gradient across the Sierra crest. A cold air mass in the Mono Basin rushed over ridges and into canyons on the range's western slopes. This particular event has been classified as an extreme instance of Mono Wind.

Mono Winds are katabatic in nature. The dense, cold air that collects in the upper elevations of the eastern Sierra move down slope to displace lower pressure air in the western valleys. Wind speeds increase as the colder air descends.

Below is a screen-shot from the anemometer at the top of Mammoth Mountain on Dec 1. It shows gusts at or above 150 miles per hour (mph) for 9 hours and one hour of average speeds at 140 mph. NOAA meteorologists in Reno estimated that winds gusted closer to 170-180 mph.



Recorded ridge top gusts are only one indicator of windstorm severity. The resulting winds came from the northeast. Trees with root structures grown to accommodate local prevailing winds, which are generally southwest, were often uprooted from the “weak side”.

To picture how this windstorm acted on the landscape, imagine you have a physical relief map of the northern Inyo. Now watch as a large bucket of water is poured into a gap at one of the passes. See how quickly the water moves down the open canyons and how it sloshes up the walls as its path bends and turns. Notice how it swirls in rounded openings like meadows on its way to fill the lowest basins. High speed katabatic winds behave a lot like this imaginary water.

This wind event caused extensive tree damage, which can be attributed to several factors including wind speed, direction, and behavior. The forests most highly impacted were often composed of red fir or other tall trees with large canopies. Denser stands, like lodgepole pine, often restrict damage to several dozen trees by slowing the wind as it passes. More open stands, like red fir, allow the wind to maintain its energy. In fact, “Windspeeds in a stand with little

foliage may be twice that in stands with dense foliage.”² In both cases areas on the downwind side of openings received the brunt of the gale.

Blowdown Trail Damage – Completion of a Rapid Assessment & Response:

During winter and spring 2012, Mammoth Ranger District trail personnel completed an assessment of trail damage caused by the blowdown. Windstorm damage was recorded for all sixteen trails with access into the John Muir Wilderness on the northern Inyo NF. Seventy percent of trail access into the Inyo NF portion of the Ansel Adams Wilderness was affected by the windstorm.³ Down trees were piled up to ten or twelve feet high on sections of wind-damaged trails. Root balls had pulled up large sections of trail tread and damaged trail structures. Some sections of trails were obstructed by such large areas of blowdown that travelers could not get around.

From the initial assessment, a “color system” was developed to classify severity and map extent of trail damage. This “color system” classed severity of trail damage into three categories, as follows:

- “Green” sections of trail would require the least amount of work and be simplest to clear. “Green” trails had fewer than ten blowdown trees per mile, with fewer than three trees larger than thirty inch diameter, and no pile-up of trees which would be hazardous or require technical skills to clear.
- “Yellow” sections of trail would require a moderate amount of work and some technical skill to clear. “Yellow” trails had ten to twenty trees per mile, with as many as five trees larger than thirty inch diameter, and one hazardous or technical pile-up to clear.
- “Red” sections of trail would require the most amount of work and be most difficult to clear. “Red” trails had more than twenty blowdown trees per mile, with more than 5 trees larger than thirty inch diameter, and multiple areas with pile-up of trees which would be hazardous or require technical skills to clear.

A Minimal Requirements Decision Guide (MRDG) was prepared by Inyo NF staff, and was then signed by both Mammoth District Ranger Jon Regelbrugge and Inyo Forest Supervisor Edward Armenta. The MRDG provided an analysis of various alternatives for clearing system trails. Out of 3 options in the MRDG worksheets, the Deciding Officials selected alternative 2 as the most desirable for implementation based the criteria considered, including crew safety, cost and effectiveness in achieving trail clearing objectives. Under Alternative 2, blowdown trees would be cleared from trails with “crosscut saws, traditional tools and case-by-case chainsaw use”. The MRDG explains in summary, “With the combination of traditional tools and motorized tools being available to trail crews, wilderness staff believes the majority of the four trail priorities (1st: PCT; 2nd: JMT; 3rd: trails over passes; 4th: trails to popular lake basin destinations) could be cleared by the end of the 2012 season.”

² Fosberg, Michael A. *Windthrown trees on the Kings River Ranger District, Sierra National Forest: meteorological aspects*. Res. Note PSW-381. Berkley, CA: Pacific Southwest Forest and Range Experiment Station, Forest Service, U.S. Department of Agriculture; 1986. 4p.

³ Novak, Jeff. *Red’s Meadow-Mammoth Crest 2011 blow down event MRDG*. Arthur Carhart National Wilderness Training Center; April 4, 2012. 39p.

The primary objective for trail repair was to open the trails for visitor use during summer 2012 by cutting blowdown trees from trail corridors. A secondary goal was to mitigate watershed impacts by stabilizing trail tread and minimizing sedimentation resulting from uprooted trees in the trail. To stabilize trail tread and minimize sedimentation, temporary crib walls and tread material were placed in the holes left after removal of root wads.

Special funding was solicited to cover the unexpected expense of trail clearing and repair work. Fiscal Year 2012 funding was allocated through several programs, including the Capital Improvement and Maintenance – Legacy Roads and Trails, Pacific Crest Trail, and Capital Improvement programs. This allocated funding is summarized in the following table.

FY12 Funding Allocated (\$)	
CMLG	60,000
PCT	57,500
CIP	30,000
Regional	130,000
Total	277,500

Work Accomplished – Agency Crews & Partners:

Inyo NF trail and fire personnel assumed the lead role in implementation of trail clearing and repair work, while partner organizations and volunteers completed a majority of the actual labor. By end of summer 2012, more than 4700 trees had been cut from 290 miles of trail. This work was accomplished through a total of 29,600 hours of labor with an estimated value of \$617,160.00.

Inyo NF personnel could not have accomplished what they did without the generous contributions of numerous partnership organizations. Partner organizations and volunteers accomplished sixty percent of the trail clearing labor. This trail clearing effort was a success thanks to the hard work of all the following groups.

American Conservation Experience

In working with the American Conservation Experience (ACE) crew, Inyo NF had an opportunity to establish a valuable new partnership. The ACE contributed a crew of 8, including a skilled trail crew and crew leader, for trail clearing work. The ACE crew leader was self-contained and providing all the supplies, tools, camp gear and food needed for their work on this project. The Forest, under an agreement, hired the crew for 8 PP to bring a continuous workforce throughout the cleanup process. ACE crews mobilized to the more remote work locations, such as the Fish Creek Trail, the Pacific Crest Trail and the John Muir Trail in the Silver Divide area. The Forest provided two Trail Leaders for the ACE crew for added experience and leadership, making the ACE crew the primary workhorse for opening the PCT and John Muir Trails. The crew worked over 5200 man hours, cleared over 500 trees, opened 35 miles of trails at a value of \$108,420.00.

Backcountry Horsemen of California

The partnership between the Backcountry Horsemen of California (BCH) and the Forest Service has become an outstanding example of user groups working for a common goal to provide open trails for all wilderness visitors. Under a regional agreement with the Pacific Crest Trail Association and Forest Service, the BCH provided over 40 personnel for three weeks to tackle some of the worst sections of blowdown on trails connected to the PCT and JMT. By utilizing their stock skills, they were able to assist in supporting crews with greatly needed supplies and tools to continue the assault on the blowdown. Their saw skills were critical to maintaining the safety record of no injuries on the project. Led by Dr. Bill Carter, the Backcountry Horsemen cut over 900 trees on both the Inyo NF and the Sierra NF. The BCH contributed over 4500 hours of volunteer time at a value of \$93,825.00.

Friends of the Inyo

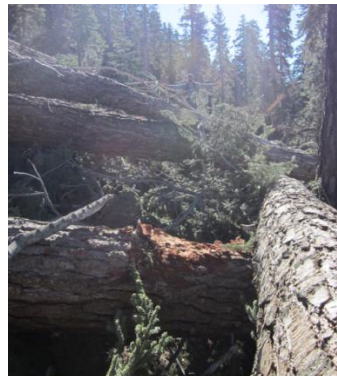
The non-profit organization, Friends of the Inyo (FOI), works to coordinate volunteers and make their own wilderness stewardship personnel available to the Inyo National Forest. The FOI has partnered with the Forest Service for over ten years and provides skilled volunteers to assist with trail work, restoration projects, data collection and educational information for wilderness visitors under the direction of the District Ranger. Throughout the summer, FOI sponsored trail days and advertised special wilderness work opportunities. Wilderness stewards, trail crews and volunteers working under the umbrella of FOI contributed over 2600 hours of labor and assisted with cutting over 200 trees and opening 65 miles of trail impacted by the blowdown. This partnership contribution is estimated at a value of \$54,210.00.

Pacific Crest Trail Association

The Pacific Crest Trail Association (PCTA) has partnered with the Inyo National Forest for the past eleven years. The PCTA supported the trail clearing work on the Forest by providing saw support from the *Can Do Crew* (CDC), a regional volunteer trail crew. The PCTA provided per diem and reimbursement for mileage for the CDC. The primary job of the CDC was to repair the trail tread to a standard safe for passage by wilderness users. The CDC worked two separate hitches in clearing sections of the PCT affected by the blowdown. Their work amounted to over 1920 man hours, which included 23 different personnel, 20 working days and cutting over 100 trees. They opened 5 miles of impassable trail. This partnership contribution is estimated at a value of \$40,032.00.



Crosscut saw work



pileup on trail

Student Conservation Association

The Student Conservation Association (SCA) provided 3 crews for a total of thirteen and a half weeks of work. A Corp Crew of young adults worked with Forest Service crew leaders on the Pacific Crest Trail. A Pro Crew of SCA Crew Leaders worked clearing a popular trail loop out of Red's Meadow, and a high school aged crew assisted with multiple projects across the northern Inyo. The regional representative provided crews that otherwise would have been on projects throughout R5 to assist with the massive cleanup once the Forest situation was announced throughout the FS. They cut well over 400 trees repaired and opened 25 miles of trail. Many of the section of trail were located in the section called Red Zones and required an intense work ethic to complete the projects. These young adults contributed over 5100 man hours at a value of \$106,335.00.

USDA Forest Service, Redding Smoke Jumpers

The Forest had a need for a highly skilled team of sawyers for the initial attack on the section of trail demanding C buckers and a high level of hazard tree awareness. A group of 10 fire fighters from the California Smokejumper base in Redding were ordered and worked to clear some of the designated "Red Zones" out of Red's Meadows during the early summer. Though primarily utilized for their chainsaw experience, they also helped Inyo trails personnel clear a long stretch of the PCT using traditional tools. Once the Jumpers had opened the worse section of trails other less skilled personnel with proper supervisor could be utilized in the cleanup. This crew provided a safe corridor for other crew to walk through in route to other projects. The crew cut over 800 trees in 10 days and opened 20 miles of the heaviest hit sections of the PCT, JMT trails.

USDA Forest Service, Porterville 1039 Fire Crew

The Porterville 1039 Fire crews provided a crew of 6 skilled sawyers and 6 swamper needed to open the Mammoth Pass trail, the only access trails to Red's Meadow from the Lakes Basin (used as an exit trail for PCT hikers needing resupplies on their hike through Red's Meadow). The crew cut over 500 trees in 10 days and opened 12 miles of trail. The crew hails from the San Joaquin Valley near Porterville, and members represent the Hispanic community there. This project was a new challenge for the crew and they met the project head on opening the assigned trails to Red's.

USDA Forest Service, Inyo NF Fire Crews 2 & 3 and Engines 22 & 23

Inyo National Forest utilized the fire crews on the Forest to assist cutting open forest trails accessing the Devil Postpile and Rainbow Falls area located in the Devil Postpile National Park. The crew also identified and removed the hazard trees accessing front country trails, day use trails and trailhead parking areas in the Red's Meadow Valley. The crews opened over 15 miles of trail and cut over 400 trees. They also contributed to the success of trail clearing work in 2012 by quickly opening the Mammoth Lakes Basin, Upper Crater Meadows, Fish Creek, and sections of the Pacific Crest Trail contributing over 2400 man hours to the project.

USDA Forest Service, Inyo NF Trail Crew Leaders

Funding for Trail clearing work allowed the northern Inyo to rehire 3 Wage Leader level trail crew supervisors and 1 GS scale trail crew member with approximately 24 years of shared experience. Their expertise in traditional tools and primitive skills was a determining factor in the success of the project. The northern Inyo Trails Supervisor and Wilderness Supervisor drafted the comprehensive Trail clearing work JHA's and safety plan. Inyo crew leaders flagged trail corridors for visiting fire crews and supervised those crews during several wilderness missions. They provided training for partnership agencies, teaching crosscut certification classes, holding safety meetings at new crew orientations and overseeing daily clearing operations on the ground. Whether working together as a professional unit or supervising partnership agency crews, almost all crosscut work for Trail clearing work was overseen by Inyo NF trails personnel. The impeccable safety record of the project is largely thanks to their knowledge and foresight.

USDA Forest Service, Inyo NF Packers

Pack animal support was largely handled by Inyo National Forest packers. Their work was invaluable for the trail crews tasked with wilderness work. Packers moved entire camps as the work progressed and provided vital resupplies of food and equipment. Pack stock has traditionally been *the* support system for trail crews throughout the Forest. During Trail clearing work 2012, 462 mule loads were hauled over 72 packer days for 7 crews in 18 locations. Professional packers handling the logistics of moving camp enabled trail crews to focus on cutting trees. Wilderness Manager Michael Morse is in charge of the Forest packing program. His involvement packing crews also allowed him to check in with leaders on the ground and supervise clearing efforts as a whole. Additional pack support was contracted through local permittees, including Red's Meadow Pack Station, Mammoth Lakes Pack Outfit, Frontier Pack Train and McGee Creek Pack Station.



Forest pack string resupplying crews



Inyo Forest Packers in backcountry camp

A Tribute to Safety:

Each phase of trail clearing work 2012 had the potential for injury and accidents. Technical bucking situations on difficult terrain, often in a wilderness setting, made safety the number one priority for management and trail crew leaders. Job hazard analyses were reviewed at frequent safety meetings. Crosscut and chainsaw crews received refresher training and recertification to ensure sawyers would be at the top of their game. Crew supervisors with “C” level crosscut and/or chainsaw certifications worked tirelessly to identify and mitigate hazards.

To date there have been no project related injuries. Trail clearing work in 2012 succeeded due to thorough planning, communication and the safe execution of those of project goals.

Future Work:

Trail clearing work in 2012 exceeded the original goals by clearing 290 miles of trail instead of just the PCT/JMT. Nonetheless, more funding will be needed for 2013 and beyond to maintain trails to assigned maintenance levels as directed in the Inyo NF Land and Resource Management Plan (1988). Specifically, the 45.9 miles of the Pacific Crest Trail administered by the Inyo NF will need tread repair and structures replaced where downed logs or upturned root wads damaged them; it may also be necessary to install new structures where water flow was altered by significant blowdown.

The PCT is a service level 4 trail on the northern Inyo NF. The Inyo NF Trail Management Plan (2004) defines class 4 trails as “wide and relatively free of obstacles...Maintenance is performed frequently and as early in the use season as possible.” As of October 1, 2012, the PCT and its access trails have not yet not maintained to their assigned levels. Obstacles still exist. Fire crews and Backcountry Horsemen volunteers who opened trails with chainsaws often cut around difficult bucking situations leaving short reroutes behind. These reroutes are often on an unsustainable grade (as measured by % slope) or make quick turns unsuitable for stock users. Many trees along trail corridors are leaning and ready to fall in winter winds. These are expected to fall in years to come creating further need for crews to keep trails open. Craters left in trail tread by upturned roots have not been filled, or only filled temporarily. Damaged structures that could not be replaced in kind during the 2012 trail clearing effort will need repair in order for the trails to maintain their assigned trail class. These structures may need to be further supported by new structures as loose top soil which is no longer anchored in place by root systems runs down into the San Joaquin River watershed. Trail structures are often the only form of sediment mitigation in a wilderness area.

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Appendix 1 – Photos and Maps of Blowdown Damage & Work Accomplished:

Before:



This down tree on Purple Creek, between Purple Lake and Cascade Valley, completely covered the trail. You can barely see the trail crew member in the first picture due to the entanglement of trees and limbs. The final product allowed safe and easy passage for hikers and stock users.

After:



Before:



This downed tree on the PCT/JMT between Purple Lake and Lake Virginia tore its root ball out of the ground; both trunk and roots are within the trail clearing limits. Once this tree was cut the root ball had to be moved to allow for clear passage on the trail (You can see the root ball in the lower right corner of the after picture).

After:



Before:



These trees on the PCT/JMT just to the North of Purple Lake covered both sides of the switchback. You can see the trail crew members marking the trails in the first picture.

After:



Before:



Clearing this pile up in Tully Hole on the JMT/PCT of over 13 trees took 20 cuts. It spanned over 50' of the trail. One of the trees, 48" in diameter, was parallel in the trail. The 2 logs cut from its trunk weighed 4.5 tons each—they were removed with traditional tools by 4 Forest Service trail workers. As you can see by the first picture the trail was completely covered.

After:



Before:



On this switchback the trees were covering both the top and bottom trails, along with a couple of root balls that were loose and would move when the cut was made. After many cuts and some tread repair (all in a hail storm), the JMT/PCT to Silver Pass was clear.

After:



Before:



These trees fell on the JMT/PCT between Purple Lake and Lake Virginia, covering the trail and forcing the hikers to go off trail.

After:



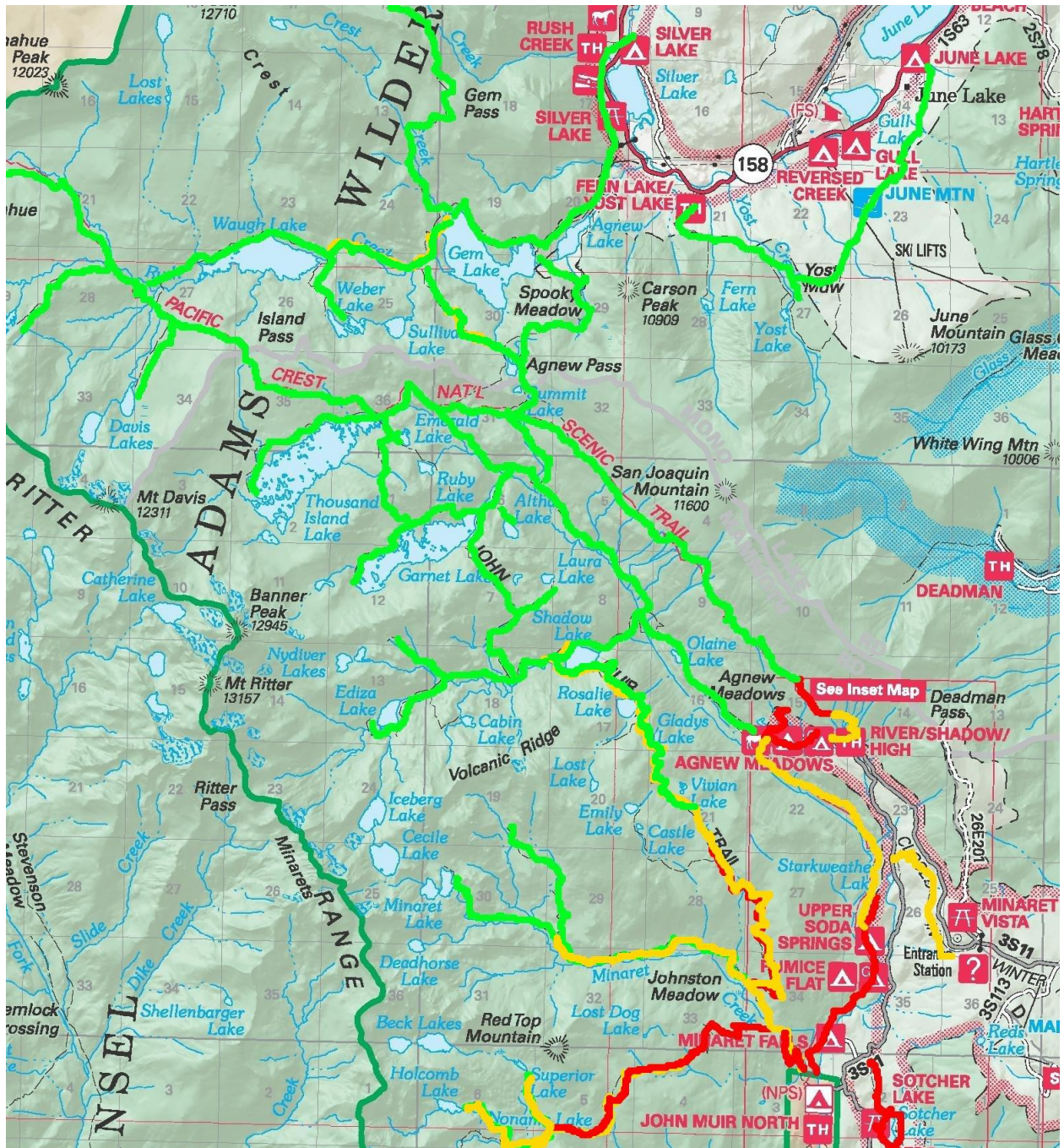


Figure 1 Map 1: Trails color coded for blowdown severity, June 2012.

Appendix 2 – Summary of Work Accomplished:

Table 1: Work accomplished by trail, crew and tool type.

Crosscut				
Trail	From	To	Miles	Crew
JMT	Postpile	Shadow Lk	10	ACE, KD
Fish Crk	2 nd Crossing	PCT Jct	9	ACE, KD
Emily Lk	JMT jct	.5 miles up	0.5	ACE, KD
Shadow Lk Trail	JMT Jct	Cecile Lk	4.059	BCH
Lk Ediza			0.4	BCH
Superior Lk	JMT Jct	Beck Lks	5.9943	BCH
Minaret Crk	Minaret Mine Jct.	Minaret Lk	1.5	BCH
Cecile Lk	Minaret lk	Cecile Lk	0.551	BCH
PCT	Upper Soda Springs	River Trail cutoff	2.5	Can-Do-Crew PCTA, ITC
Fish Crk	Crater Crk	Island Crossing	3.5	Crew 2, Inyo Trail Crew
PCT	thousand Island Lk	Donahue Pass	7	FOI
20 Lakes Basin Loop			4.2898	FOI
Saddlebag Lk Loop			4.0663	FOI
Davis Lk			0.8589	FOI
Alger Lks			10.089	FOI
Laura Lk			0.6553	FOI
Emerald Lk	Garnet	Emerald	1.9773	FOI
Garnet Lk			1.1023	FOI
Clark Lks			3.9148	FOI
Bloody Cyn			4.7964	FOI
Walker Lk N			1.2869	FOI
Marie Lks			1.6439	FOI
Thousand Island Lk			1.9583	FOI
Parker Lk			1.8532	FOI
Parker Bench			5.0511	FOI
Yost Meadow Loop			6.9205	FOI
Fern Lk			0.7822	FOI
Yost Lk			0.2206	FOI
Convict Crk			7.5303	FOI
Dorothy Lk			1.2623	FOI
Convict Lk Loop			2.0019	FOI
Convict Pack Station			0.374	FOI
Convict Hiker			0.4451	FOI
Convict vis.			0.3485	FOI
River Trail	Clark Jct	PCT Jct	2	FOI
Gibbs Lk			2.6572	FOI
Garnet River Tr Cutoff			1	FOI
Altha Lk			0.321	FOI
Agnew Pass			0.6989	FOI
Emerald Lk			0.3655	FOI
Arrowhead Loop			0.6061	FOI
Skelton to Emerald			0.8371	FOI

Crosscut

Trail	From	To	Miles	Crew
Mammoth Rock Trail			2.6383	FOI
Coldwater to George			2.9034	FOI volunteer day, ITC
TJ Loop			0.3788	FOI volunteer day, ITC
Crystal Lake			0.2652	FOI volunteer day, ITC
JMT	Ediza Jct	Thousand Island Lk	3.5	FOI, intern Eric
Rush Crk	Trailhead	Alger Lks Jct	5	FOI, Intern Wedge
Rush Crk	Waugh Lk Jct	PCT Jct	3.5	FOI, Intern Wedge
Spooky Mdw			3.8542	FOI, Intern Wedge
Spooky Mdw to Clark			0.2917	FOI, Intern Wedge
Duck Pass	TH	Duck Pass	3.8845	FOI, Inyo Trail Crew
Lundy Canyon			3.1468	KD
PCT	Purple Lake	2 mi past Duck Crk Mdw	5	Inyo Trail Crew
Shadow Lk	PCT Jct	JMT Jct	4.0095	Inyo Trail Crew
Sherwin Lk			3.1723	Inyo Trail Crew
Mammoth Crest			7.4612	Inyo Trail Crew
Duck Pass	Duck Pass	PCT Jct	1.919	Inyo Trail Crew
Valentine Lk			4.7348	Inyo Trail Crew
Ram Lk			2.4242	Inyo Trail Crew
Starkweather			2.482	ITC, Crosscut Saw Class
McGee Pass			15.2727	Inyo Trail Crew, Intern Eric
PCT	Silver pass	Lake Virginia	7	Inyo Trail Crew, Intern Eric
Shadow Lk	Shadow Lk	Ediza jct	1.5	Inyo Trail Crew, intern Wedge
PCT	2 mi past Duck Crk Mdw	Deer Crk	2.5	PCTA-SCA
PCT	Lake Virginia	Purple Lake	2.5	PCTA-SCA, ITC, Intern Eric
Purple Lk			2.8674	PCTA-SCA, ITC, Intern Eric
PCT	Wilderness Bdry N Agnew	Thousand Island Lk	8	Redding Smoke Jumpers, ITC
Ashley Lk			1.2538	SCA Leaders, KD
Summit Mdw to Holcomb			2.0057	SCA Leaders, KD
Fern to Anona			0.2727	SCA Leaders
Holcomb Lk			1.804	SCA Leaders, KD

CC saw mi cleared	222.461
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Chainsaw

Trail	From	To	Miles	Crew	Wilderness
PCT	Deer Crk	Lower Crater Mdw	2.5	BCH	Yes
Summit meadow	Postpile Bndy	Summit Mdw	4.5246	BCH	Yes
River trail	Shadow Lk Jct	Clark Lk Jct	3	BCH	Yes
Minaret Crk	JMT Jct	Minaret Mine Jct	2.5	BCH	Yes
PCT	Rainbow Falls TH	Postpile Bndy	0.5	Crew 2	No
Fish Creek	Rainbow Falls TH	Wilderness Bndy	0.716	Crew 2	No
Lower rainbow Falls			3.0246	Crew 2	Yes
Upper Crater Mdw			2.5701	Crew 2	Yes
Fish Creek cutoff			0.785	Crew 2	Yes
PCT	River Trail Cutoff	Wild. Bndy N of Agnew	1.5	Crew 3	No
Horseshoe Lk Loop			1.7	Crews 2, 3, Engs. 22, 23	No
Mammoth Mountain			3.5	Crews 2, 3, Engs. 22, 23	No
Bottomless Pit			0.7	Crews 2, 3, Engs. 22, 23	No
Mth. Mt. Mth. Pass Cutoff			1.2	Crews 2, 3, Engs. 22, 23	No
Barret Mary			1.1004	Crews 2, 3, Engs. 22, 23	No
Mammoth Lks Pack			1.685	Crews 2, 3, Engs. 22, 23	No
Panorama dome			3.5	Crews 2, 3, Engs. 22, 23	No
heart Lake			1.0417	Crews 2, 3, Engs. 22, 23	No
Mountain View Bike trail			8	Crews 2, 3, Engs. 22, 23	No
Rush Crk	Alger Lks Jct	Waugh Lk Jct	1	Jon Regelbrugge	Yes
Sotcher Lk Feeder			0.2	ACE, Inyo Trail Crew	No
Mammoth Pass			4.0322	Porterville 1039 Fire	Yes
PCT	Lower Crater Mdw	Rainbow Falls TH	3.5	Redding Smoke Jumpers	Yes
PCT	Postpile Bndy	Upper Soda Springs	2	Redding Smoke Jumpers	Yes
Sotcher Lk Loop			1.4252	Redding Smoke Jumpers	No
Sotcher Lk Red's			0.1468	Redding Smoke Jumpers	No
River Trail	PCT Jct	Shadow Lk Jct	0.9725	Redding Smoke Jumpers	Yes
Fish Creek	Wilderness Bndy	Crater Crk	3.5	Redding Smoke Jumpers	Yes
Red Cones Cutoff			3.0246	Redding Smoke Jumpers	Yes
Mammoth Pass Cutoff			3.5473	Redding Smoke Jumpers	Yes

Chainsaw mi cleared	67.396
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ACE = American Conservation Association

BCH = Backcountry Horse Men

FOI = Friends of the Inyo

KD = Keith Dawley, Trails Supervisor

ITC = Inyo Trail Crew

PCTA = Pacific Crest Trail Association

SCA = Student Conservation Association